Psychosocial stress, physical health and self-conscious emotions in adulthood: an exploration of the feasibility of distinguishing between ancient and modern stressors

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Acknowledgements

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With wholehearted appreciation,

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Abstract

Background: Extensive research has highlighted the impact of psychosocial stressors on coping, physical health, and emotions. A novel conceptualisation of this is the distinction between ancient and modern stressors; the idea that established adaptive psychophysiological coping processes exist enabling individuals to cope with ancient stressors whilst being less able to cope with modern stressors. Such a distinction could be observed in differential effects on stress responses and common cold symptoms via allostatic processes. The emotions of shame and guilt have also been distinguishable by their adaptive coping profile and have been associated with increased stress reactivity.

Aim: The overall aim of this research programme was to assess the feasibility of distinguishing between ancient and modern stressors within a health context from a psychological perspective. This focus enabled a fuller understanding of psychosocial stress and identified stressors that might have the most deleterious effect on health.

Methods: This research employed mixed methods; sequential, quantitative, multiphase designs across three studies. Studies one and two utilised quantitative and qualitative methods (questionnaires, interviews) with younger and older adults. Study three employed an experimental design (computer-based implicit task) and utilised quantitative methods with adults.

Main findings: Study one identified psychological characteristics enabling a provisional ancient/modern stressor distinction and that younger adults were more likely to express shame associated with ancient than modern stressors. Study two confirmed

this distinction based on these characteristics and found that older adults reported both shame and guilt across ancient and modern stressors. It also found associations between modern stressors and common cold symptoms. Study three identified that the distinction between ancient and modern stressors in adults was present at an implicit level of consciousness and an explicit level of cognition.

Conclusion: This research programme provides evidence to support the feasibility of an ancient versus modern distinction in stress categorisation. Younger to older adults appear to be better able to cope with stressors designated as ancient and less able to cope with more modern stressors. Individuals' perceptions and coping resources make a stressor moving along an ancient/modern continuum depending on its characteristics. Findings have important health implications when examining the effects of different types of stressors.

List of abbreviations

ANOVA/ANCOVA: Analysis of variance/covariance

APA: American Psychological Association

BPS: British Psychological Society

CA: Content analysis

CAR: Cortisol awakening response

GAS: General adaptation syndrome

CCQ: Common cold questionnaire

EEG: Electroencephalogram

fMRI: functional Magnetic Resonance Imaging

GI: Guilt inventory

GNAT: Go/no go association task

HPA: Hypothalamus-pituitary-adrenal axis

IAT: Implicit association test

ISS: Internalised shame scale

LEC: Life events and circumstances checklist

LEDS: Life events and difficulties schedule

LEI: Life events inventory

PANAS: Positive and Negative Affect Schedule

PNI: Psychoneuroimmunology

PSS: Perceived stress scale

PTSD: Post-traumatic stress disorder

QoL: Quality of life

RT: Reaction time

SAM: Sympathetic-adrenal medullary system

SCEs: Self-conscious emotions

SES: Socio-economic status

SRRS: Social readjustment rating scale

SSGS: The State Shame and Guilt Scale

STAI: State-trait anxiety inventory

TA: Thematic analysis

TOSCA-3: Test of self-conscious affect

TSST: Trier social stress test

URTIs: Upper respiratory tract infections

WHO: World Health Organisation

WURSS-21: Wisconsin upper respiratory symptom survey

Chapter One: Overview

1.1 Chapter overview

This chapter will introduce the novel and innovative concept of ancient and modern stressors within this programme of research and the subsequent thesis. The research presented in this thesis is embedded within the discipline of health psychology. The psychosocial stress literature highlights a lack of research considering stress from the perspective of ancient and modern stressors, their distinction, and their association with physical health and self-conscious emotions (SCEs). The overall aims and research questions of this research programme will be discussed together with the individual objectives of each of the three studies undertaken. The remainder of this chapter will provide a synopsis of the seven chapters within this thesis.

1.2 Stress in everyday life

Stress has often been used as a lay term by individuals in everyday life, although some personality types might experience and perceive more stress; for example, those with type A behaviour characterised by hostility, aggression, competiveness and impatience, or type B behaviour characterised by social, non-aggressive and cooperative styles (Sarafino & Smith, 2014). Stress has been seen as an unavoidable part of life, impacting people of all ages, and for this reason they learn how to deal with it in order to survive and thrive across the lifespan. Inappropriate and insufficient coping with stress can affect physical and mental health, lead to negative psychological outcomes and influence several aspects of life such as work, marriage, friendship and hobbies (Segerstrom & O'Connor, 2012). Over the last five decades researchers have been

increasingly interested in exploring several key themes that are related to and influenced by stress, such as early life experiences and adversity; psychological, social, biological, behavioural, environmental, physiological and demographic factors; personality and temperament; social support and coping strategies; genetics; cognitive skills; positive and negative emotions; good and bad health outcomes (Beckie, 2012; Lutgendorf & Costanzo, 2003; Segerstrom & O'Connor, 2012).

Although there has been extensive research on stress and several definitions and classifications, there are also some lay perspectives (myths) about what stress is. For example, people often believe that stress makes you ill (i.e. a causal relationship); is referred to as 'nerves'; is the same and always bad for everyone and is everywhere so no one can avoid it; the most popular coping techniques for reducing stress are the best ones; no symptoms means no stress; and attention should be paid only to major stress symptoms (American Psychological Association (APA), 2014). Research takes place not only to better and fully understand stress, but also to debunk some of these stress myths and make it a comprehensible term to the wider population.

Some of the most widely and well-known classifications of stress vary from negative, uncontrollable and intolerable (i.e. distress) associated with negative effects and feelings, detrimental harm to health and well-being and disturbed bodily states to positive (i.e. eustress) associated with positive feelings and challenges, healthy and motivational states, and improved performance; and from acute (episodic, short-lived, time-limited) to chronic (enduring, long-term), which rely upon the intensity, duration, nature and frequency of the stressor, as it is considered to be on a continuum (Kupriyanov & Zhdanov, 2014a; Sarafino & Smith, 2014; Selye, 1976). Although the majority of research has examined the psychological and physiological features of negative, acute or chronic stress, this research programme extends the categorisation of

stress to include the potential distinction of stress as ancient or modern in order to better define and operationalise it (Baum, 1990; Benight et al., 1999; Topf, 1989).

Definitions of stress vary between stimulus-oriented, response-oriented and transactional-oriented (i.e. the person-environment interaction) (Forman, 1993). Stress, which is dynamic, is experienced differently by individuals depending on their own characteristics at several stages of life (Segerstrom & O'Connor, 2012). Within this thesis, the transactional theory of stress and coping is considered to examine ancient and modern stressors. The most widely accepted definition of psychological stress, which this research also takes into consideration, is that it is "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984b, p. 19).

There are many different definitions, scientific theories, types, models and classifications of stress from acute to chronic and from mild and moderate to severe. To conceptualise stress within the research world and provide a more complete, holistic and comprehensible knowledge of stress to the wider population, there has been extensive research conducted about the interrelationship between stress, coping, emotions and health. Apart from one study (Schreier & Evans, 2003), stress has not been considered in the context of ancient and modern stressors from a psychological perspective; thus, the present research programme aims to do this.

The present research falls within the academic discipline of health psychology and places particular emphasis on the key research approach of allostasis and allostatic load. Ancient and modern stressors are linked to the notion of adaptation and ability to cope, which are also closely connected with the theory of allostasis defined as "stability through change" (McEwen, 1998b, p. 33). The theory of allostasis and allostatic load is

embedded within the wider research field of psychoneuroimmunology (PNI), which explores the relationships between psychosocial processes and the nervous, endocrine, and immune activities (Evans, Hucklebridge, & Clow, 2000).

Psychosocial stressors can influence physiological systems resulting in allostatic load and thus ill physical health (Turner-Cobb, 2014). The transactional theory and the theory of allostasis are considered in this research programme as an integrated model to investigate associations between ancient and modern stressors, coping and physical health (Lutgendorf & Costanzo, 2003; McEwen, 2007). Specifically, successful adaptation and efficient coping with ancient stressors could lead individuals to survive, as these stressors have been an integral part of human evolution and ancestral past. Inability to adapt and ineffective coping with modern stressors could lead individuals to allostatic load and wear and tear of physiological adaptive bodily systems (McEwen, 1998b; McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling, 2012; Sterling & Eyer, 1988).

1.3 First encounter with ancient and modern stressors

From an evolutionary and anthropological perspective in Current Anthropology journal (Schreier & Evans, 2003), Klein (2009) defined ancient stressors as "chronic demands that have likely accompanied the human species throughout its existence"; and modern stressors as "new demands originating during the Neolithic period, generally defined by the advent of agriculture 10,000-12,000 years ago, and from the industrial society to the digital era" (Schreier & Evans, 2003, p. 306).

Focussing on these topics, findings suggested a significant positive association between modern stressors and physical health symptoms as well as a distinct classification of negative life events and daily hassles as ancient and modern stressors

using a mixed-methods framework approach (Katsampouris & Turner-Cobb, 2015). The idea to explore this novel and innovative ancient and modern stressors concept further has resulted in the following thesis. A range of research has been conducted about stress from different scientific perspectives, but a further classification that incorporates evolutionary concepts would provide a better understanding of it. Such a stressor classification would not only add a new insight into stress research but would also fill a gap in the scientific literature in relation to the knowledge and limited studies on ancient and modern stressors (Turner-Cobb & Katsampouris, 2018).

1.4 Research aim and questions

The overall aim of the current programme of research was to explore the feasibility of distinguishing between ancient and modern stressors within a health context. Therefore, to address this aim the primary research questions under investigation in this thesis were:

1. Which psychosocial factors do younger adults find stressful and why; can these reasons provide evidence to categorise stressors as ancient and modern? [Study one; part one].
2. What are the necessary criteria to make a provisional distinction of psychosocial stressors as ancient and modern? [Study one; part two].
3. Can the stress appraisal and stress experiences of older adults provide evidence of underlying psychological stressor characteristics to explore the feasibility of distinguishing between ancient and modern stressors? [Study two].
4. Are ancient and modern stressors implicitly distinguishable? [Study three].

1.5 Structure of the thesis

1.5.1 Chapter two: Literature review

The literature review chapter gives an overview of the main theoretical approaches to stress, coping, physical health and SCEs focusing on the theories utilised in the present research and previous research which has investigated the relationship and effects of psychosocial life event stressors on physical health and SCEs. This chapter also presents the limited literature about ancient and modern stressors as well as the context that these stressors have been set in relation to the transactional model of stress and coping and the theory of allostasis and allostatic load.

1.5.2 Chapter three: Methodology

The methodology chapter begins with a discussion of epistemologies and quantitative, qualitative and mixed-methods approaches, and provides a rationale for the use of mixed methods in the present research. The chapter also discusses the methods that were used in this research to collect data on stress, physical health and SCEs (e.g., questionnaires, interviews). The methods for analysing and integrating quantitative and qualitative data are discussed along with practical issues and ethical considerations in relation to conducting stress research.

1.5.3 Chapter four: Study one (Part one)

Chapter four is the first of three empirical study chapters and addresses the first research question. One hundred younger adults completed questionnaires about life events, daily hassles, perceived stress and SCEs. Twenty of those younger adults participated in interviews about their perception and coping with life event stressors and

SCEs experience. The data was analysed using correlations and thematic analysis. This study found associations between psychosocial stressors and SCEs, and explored the reasons why younger adults found life events stressful in everyday life. However, this study could not provide a plausible rationale for designating life event stressors as ancient and modern in relation to adaptation and coping. Therefore, a different analytical approach was considered and employed in study one (i.e. part two) as there was some initial evidence to designate life events as ancient and modern stressors based on adaptation and coping. The analysis focused on the exploration of psychological characteristics in a priori designated ancient and modern life event stressors from Schreier and Evans (2003) that have been matched with those life events used in this study.

1.5.4 Chapter five: Study one (Part two)

The second part of study one explores the feasibility to distinguish between ancient and modern stressors. The secondary objective was to examine gender differences in SCEs experience and coping regarding ancient and modern stressors, as Schreier and Evans (2003) had also examined gender differences in ancient and modern stressors. Regressions and content analysis were utilised to analyse the a priori designated ancient and modern stressors' data. The primary finding of study one was the identification of criteria (i.e. psychological characteristics) that were found to underlie ancient and modern stressors, suggesting a provisional ancient and modern stressors distinction. This different analytical approach and analysis enabled the integration and interpretation of both quantitative and qualitative findings, which informed study two.

1.5.5 Chapter six: Study two

Chapter six is the second empirical study chapter and addresses the third research question: to explore the feasibility of distinguishing between ancient and modern stressors in an older adult population in order to draw potential conclusions about stressors' perception across adulthood. It examines associations between ancient and modern stressors with physical health outcomes (i.e. common cold symptoms) and the SCEs of shame and guilt, as well as gender and age differences in shame and guilt experiences and coping with ancient and modern stressors. Seventy-five older adults completed questionnaires about life events, daily hassles, perceived stress, common cold symptoms, shame and guilt. Twenty-one of those older adults participated in interviews about their perceptions of and coping with life event stressors, and their experience of physical health symptoms and SCEs. The findings from study two, which were analysed through regressions and content analysis, revealed a significant association between modern stressors and cold symptoms, and provided evidence to feasibly distinguish between ancient and modern stressors in relation to psychological characteristics. The overall findings of the first two studies suggested a conscious distinction between ancient and modern stressors in adults and thus study three aimed to explore the unconscious distinction between the stressors.

1.5.6 Chapter seven: Study three

Chapter seven constitutes the last of the empirical chapters and focusses on the exploration to distinguish between ancient and modern stressors at a cognitive and unconscious level utilising an implicit paradigm. One hundred participants completed a questionnaire about ancient and modern life event stressors and took part in a reaction time computer-based task (i.e. Implicit Association Test). This implicit paradigm

assessed the strength of automatic mental associations between concepts (i.e. ancient and modern stressors) and evaluations (i.e. ability/inability to cope) using reaction time. According to previous research and in order to explore whether individuals are likely to tap into established coping mechanisms to deal with ancient stressors, it was expected that adults would unconsciously associate faster ancient stressors with ability to cope than modern stressors. The findings from study three were analysed using ANOVA, and showed that ancient and modern stressors could be implicitly distinguished in relation to adults' coping ability and inability. Study three not only verified the explicit distinction between ancient and modern stressors that was found in the first two studies, but also suggested an implicit ancient and modern stressors distinction.

1.5.7 Chapter eight: Overall discussion

The final chapter in this thesis provides an overview of the results from each of the three studies and discusses these findings in relation to the research questions outlined at the beginning of this chapter and relevant theory and literature. It suggests the feasibility and validity of distinguishing between ancient and modern stressors in younger and older adults in relation to psychological characteristics. Ancient and modern stressors can be distinguished not only explicitly but also at a cognitive, unconscious, implicit level.

Chapter Two: Literature Review

2.1 Chapter overview

This chapter outlines the broader research area within which the programme of research presented in this thesis is placed. The chapter begins with a detailed literature review of the relevant theories of stress and ancient and modern stressors, which highlights the theoretical basis for this research. This is followed by the theories and research surrounding coping, physical health and self-conscious emotions (SCEs) discussing the connection of these concepts with stress.

The literature reviewed in this chapter was gathered systematically using specific search terms between October 2014 and April 2018 on the APA PsycNET database. The search terms used (in several combinations) were: life events, hassles, acute stress, and ancient and modern stressors; physical health symptoms and common cold; coping; SCEs, shame and guilt; and adult. An email alert using these key words was set up in October 2014 to capture any new articles when they were added to the database. Other articles were found using the reference lists of articles, textbooks, and recommendations from supervisors and colleagues. This chapter firstly presents and discusses theories about stress and emotions and secondly research about stress and physical health before presenting research about stress and SCEs. The main topics of interest (i.e. stress, physical health, SCEs) will be discussed in relation to ancient and modern stressors.

2.2 Theories of stress

2.2.1 The concept of stress

Prior to Lazarus and Folkman's conceptualisation of stress as a transactional process, from an environmental perspective stress has been seen as a challenging event stimulus (i.e. a stressor); and from a physiological and psychological aspect, it has been regarded as a response or a strain focusing on individuals' physical or biological reactions to stressors (Cannon, 1929, 1932; Selye, 1946, 1950). Considering Lazarus and Folkman's definition of stress (1984b), stress is not regarded as either a stimulus or a response but instead as a process, interaction or psychological transaction between the person and the environment; the person is an active agent who responds to the stressor through cognitive, behavioural and emotional coping resources (Dougall & Baum, 2001; Hobfoll, 1989; Lazarus, 2006; Lazarus & Folkman, 1984b). Lazarus and Folkman's work marked a departure from the earlier stimulus response approach to understanding stress, towards this latter transactional approach.

2.2.1.1 Stress vs stressor

Before presenting the stress theories, the discrepancy between stress and stressor will be outlined along with indicative examples of stressors because the present research programme aims to explore stressors and distinguish them as ancient and modern. Stress is the result of experiencing psychophysiological strain because of a stressor, which is a stimulus that may cause stress through physiological responses created by environmental, physical or psychological demands (Lazarus & Folkman, 1984b; Rabkin & Struening, 1976; Selye, 1956). Thus, it is the appraisal of the relationship between the stimulus and stress response which may affect health and well-being (Kessler, Price, & Wortman, 1985; Lazarus, 1993; Sapolsky, 1994).

2.2.1.2 Life event stressors

Stressors consist of positive or negative life events, which are happenings in people's life and inherently require some psychological adjustment (Holmes & Rahe, 1967). Life event stressors can be not at all stressful or unexpected, unpredictable, undesirable and uncontrollable, and of potential risk and harm leading to life change (Dohrenwend & Dohrenwend, 1974; Holmes & Rahe, 1967; Kanner, Coyne, Schaefer, & Lazarus, 1981; Sapolsky, 1994). Life events vary from major and catastrophic to minor and daily hassles, which can increase stress and have implications on physical and emotional health (Cohen & Lazarus, 1979; Cohen & Hoberman, 1983; Cohen, Kessler, & Gordon, 1997; Compas, 1987; Lazarus, 1986; Lazarus & Folkman, 1984b).

Major and minor life events were used by Schreier and Evans (2003) (e.g., environmental, family, health, work, financial life events) to examine ancient and modern stressors. Hassles are "irritating, frustrating, distressing demands that to some degree characterise everyday transactions with the environment", and unlike life events they do not require great adjustment (Kanner et al., 1981, p. 3). However, hassles, compared to life events, are stronger associated with physical health (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982; Evans & Edgerton, 1991; Kanner et al., 1981; Lazarus, 1986). Life event and hassle stressors rarely occur separately, but instead one life event usually leads to another and contributes to the impact on physical health (Holahan, Holahan, & Belk, 1984; Schwarzer & Schulz, 1998; Turner-Cobb, 2014; Turner-Cobb & Steptoe, 1996). Similar life event and daily hassle stressors will be considered in study one of this research programme to explore what psychosocial stressors adults experienced and the reasons why in order to designate them as ancient and modern. A range of several stressors needs to be considered as this is the first research to examine ancient and modern stressors.

2.2.2 General adaptation syndrome (GAS)

One of the earliest theories of stress, the general adaptation syndrome (GAS) (Selye, 1956, 1976) focused on the stress environment rather than the stress response. The GAS was based upon the fight-or-flight acute stress response which mobilises the organism to respond automatically and quickly to a danger (Cannon, 1929). Dhabhar and Mcewen (1997) noticed in animal work that the immune system releases cortisol as a shield to resist acute stressors (McEwen & Wingfield, 2003; Sapolsky, 1994; Weinrib, 2004). Schreier and Evans (2003) also measured cortisol levels in relation to ancient and modern stressors' exposure. However, the present research programme will not focus on physiological measurements but instead on psychological measurements to explore the feasibility of distinguishing between ancient and modern stressors.

The GAS is a three-stage biological model of the stress and illness relationship (Spacapan & Oskamp, 1988). In the first stage, alarm reaction which is divided to the shock and counter shock phases, the body defends against the stressor activating the sympathetic nervous system to stimulate the adrenal glands of the endocrine system. As a result of this stage, a dual stress response is activated: the sympathetic-adrenal medullary (SAM) system releases catecholamines, i.e. adrenaline/noradrenaline hormones, which arouse the body in order to directly generate stress responses; and the hypothalamus-pituitary-adrenal (HPA) axis produces glucocorticoids (e.g., cortisol) and prepares the organism for long-term implications of a stressor (Evans et al., 2000; Herbert & Cohen, 1993; McEwen, 2007; Selye, 1956).

In the second stage, resistance, physiological arousal remains in higher levels producing stress hormones as the organism attempts to deal with the stressor. However the organism cannot maintain this intense arousal for very long, thus stress may appear and its ability to cope with new stressors may be impaired (Selye, 1946, 1950). The

inability to cope and too much or too little arousal makes people vulnerable to health problems (e.g., diseases of adaptation, ulcers, high blood pressure, asthma, immune illnesses) and influences cognitive performance (Cohen, Evans, Stokols, & Krantz, 1986).

In the third stage, exhaustion, individual's resources to adapt and deal with the stressor are very limited if the stressor is long-lasting, severe and repeated, and the physiological arousal is prolonged. As a result, the immune system weakens, one's ability to resist the stressor may collapse, and the repeated activation of the SAM system and HPA axis can make the organism vulnerable damaging the tissues and internal organs, causing physiological and psychological disorders, and leading to disease, accumulated lifetime stress or even death (Brannon, Feist, & Updegraff, 2013; Cohen et al., 1997; Engert, Kok, Papassotiriou, Chrousos, & Singer, 2017; Repetti, Robles, & Reynolds, 2011). Selye's work (mainly on animals) focused on the physiological components of stress overlooking the psychological and emotional components as well as people's appraisal of stress. These latter components were considered by Lazarus and Folkman in the transactional theory of stress.

2.2.3 Transactional model of stress and coping

The transactional theory was a landmark which has been the mainstay of stress and coping in health psychology ever since. From a relational perspective, this transactional model perceives firstly the person-environment transaction as dynamic, mutually reciprocal and bidirectional, which might cause stress and emotional responses if there is a discrepancy between the environmental demands and people's resources; and secondly coping as the effort to change either the stressor, or the emotional response or the perception of the appraisal (Appley & Trumbull, 1986; Cohen &

Herbert, 1996; Folkman, 1997; Lazarus, 1991, 1993; Lazarus & Folkman, 1984b; Lazarus & Lazarus, 1994; Lovallo, 2016; Sapolsky, 1994; Siemer, Mauss, & Gross, 2007; Smelser, 1963). From a motivational and cognitive perspective, Lazarus and Folkman (1984b) emphasised the mental process of cognitive appraisals and emotional reactions in relation to individuals' goals, well-being and perceptions of a potential stressor. The cognitive appraisals take into account some key perspectives of the person-environment transaction: people's emotions, personal characteristics (such as values, beliefs, goals hierarchies and priorities), vulnerability, and ability to cope; the stressful demands; instrumental/emotional social support; and the difficulties to overcome (Cox, 1987; Ellsworth & Scherer, 2003; Lazarus, 1991, 1993; Lazarus, Averill, & Opton, 1970; Smith & Lazarus, 1993).

The transactional model describes and suggests that stress appraisals, coping and emotions do not occur in a fixed sequence but in parallel. Primary appraisal occurs to decide in what way and whether an event would be perceived as a harm or loss that has already happened (e.g., incapacitating injury or illness, loss of a beloved person), a challenge to overcome (the likelihood to achieve growth, mastery, or profit), or a life threat of future danger; or as benign and positive, or irrelevant regarding one's physical and psychological health and well-being. Also, in the primary (or tertiary) appraisal, individuals evaluate whether the emotions that arise from an encounter are relevant and important (i.e. goal relevance); benign and consistent or harmful and inconsistent leading to favourable or unfavourable responses (i.e. goal congruence/incongruence or motive consistency); or related to individual's aims, esteem and values in relation to their well-being and goals (i.e. type of ego involvement) (Glanz, Lewis, & Rimer, 1990; Lazarus, 1966, 1991; Lazarus et al., 1970; Lazarus & Folkman, 1984b; Roseman, Antoniou, & Jose, 1996; Smith & Kirby, 2009; Smith & Lazarus, 1993; Spacapan & Oskamp, 1988). Schachter and Singer (1962) claimed that individuals can experience

physiological arousal without emotion, but they cannot experience an emotion without arousal.

Simultaneously, secondary appraisal is considered as the complex evaluation of people's ability to cope and the assessment of available coping resources as sufficient to deal with a potential stressor. Also, in the secondary appraisal, people evaluate their coping mechanisms to deal with negative emotions resulting in blame (and guilt) or credit for an outcome and positive or negative future expectations (Smith & Lazarus, 1990, 1993). Roseman et al. (1996) added that the intensity and strength of appraisals affect emotional responses. Marsella and Gratch (2003) argued that this appraisal model includes the human adaptive behaviour to a situation but lacks the dynamic, rapid and automatic nature of emotional responses that are caused by an event. Lastly, reappraisal involves an altered appraisal of new environmental information that become available to the individual (Lazarus, 1966, 1991, 1993; Lazarus et al., 1970; Lazarus & Folkman, 1984b; Monat & Lazarus, 1991; Smith & Lazarus, 1990). Appraisals and ability/inability to cope constitute important factors for adaptation to stressors and mediate the relationship between stressors and physical health (Ganzel, Morris, & Wethington, 2010).

Although the transactional model is important for this research programme to explore ancient and modern stressors as it incorporates stress appraisal, emotions and coping, it cannot be left without criticism. The whole appraisal process is regarded as cyclical (Lazarus, 1991; Smith & Lazarus, 1990, 1993). This model has been criticised regarding its circularity of the interaction between the primary and secondary appraisals (i.e. perceived environmental demands and perceived coping) and the necessity of both appraisals (Hobfoll, 1989; Zohar & Dayan, 1999). Parkinson and Manstead (1992) also argued that cognitive appraisals might not be the mere and necessary factor in the emotions process. Although Lazarus and Folkman considered the psychological and

social factors, emotions and individual differences in relation to stress appraisal, they did not refer to the relationships between the biological and psychosocial factors and the implications of these relationships to stress appraisal, stress responses and health outcomes. Lutgendorf and Costanzo (2003) added and developed the transactional theory proposing a model, which incorporates psychosocial, biological, neuroendocrine and immune factors, health behaviours, life stress, health psychology interventions, implications on health/illness and quality of life (QoL).

Regarding this research programme, figure 2.1 proposes and illustrates a modified integrated model, which could link both Lazarus and Folkman and Lutgendorf and Costanzo's stress theories in order to provide a more holistic view of the concept of stress, and key parts of which will be assessed in this thesis. The inter-relationships between the psychosocial, biological, physiological factors and health behaviours can affect individual's appraisal, emotional response and coping with a stressor and can have implications for health. Based on this model, Schreier and Evans (2003) examined the physiological and biological factors and physiological response in relation to ancient and modern stressors, whereas this research programme will explore the psychosocial and biological elements, appraisal, coping, emotions and health outcomes in relation to the stressors.

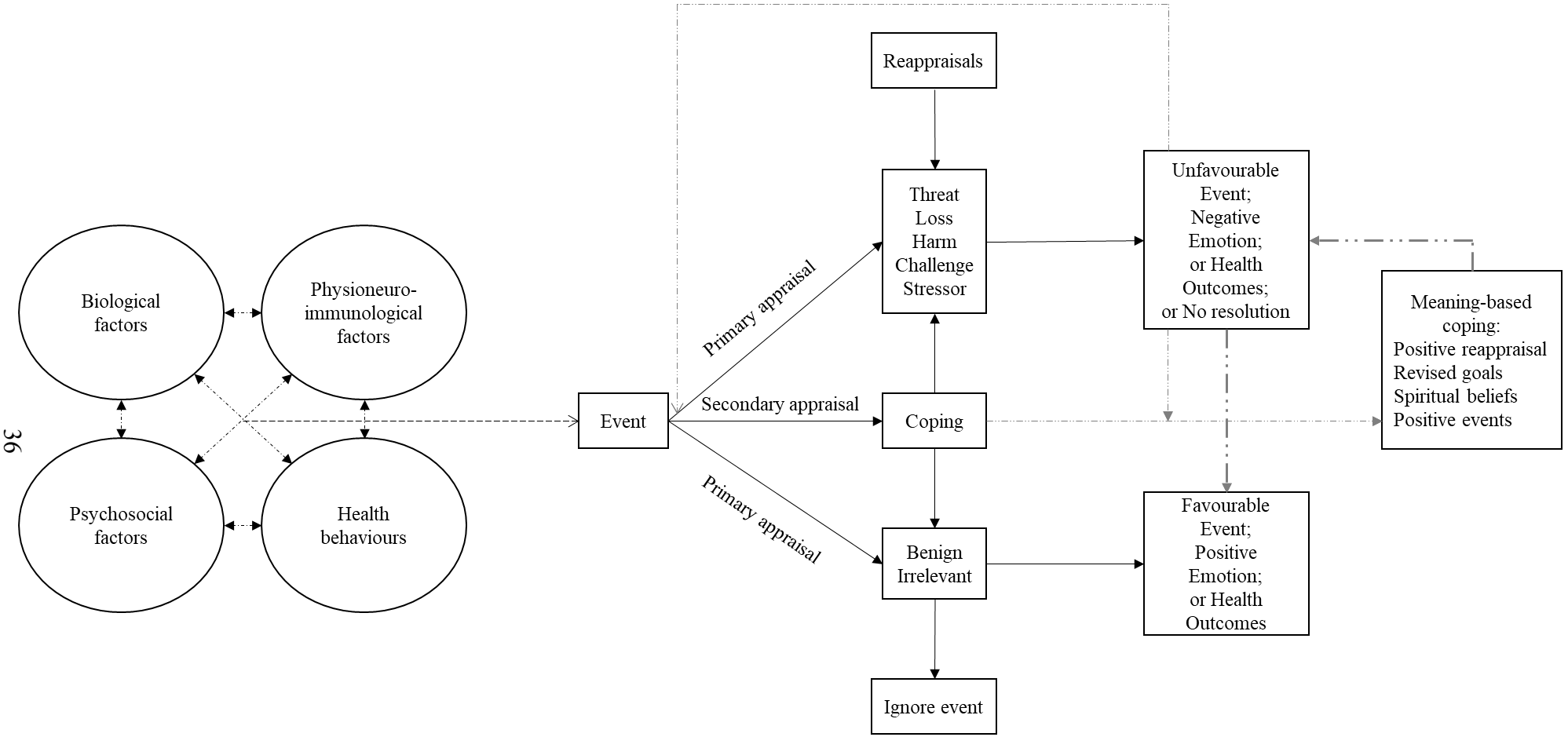

Figure 2.1. The modified stress and coping model integrating the biopsychosocial theory (i.e. on the left hand part of the figure) (Lutgendorf & Costanzo, 2003) and transactional model (i.e. on the right hand part) (Folkman, 1997).

2.2.3.1 Stress and coping

Regarding the secondary appraisal of the transactional theory, coping is a dynamic process through which individuals attempt to manage the perceived person-environment discrepancy and to regulate emotional responses to stressful encounters (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; Compas, Jaser, Dunn, & Rodriguez, 2012). Coping is defined as "constantly changing cognitive and behavioural efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984b, p. 141).

Problem-focused coping is related to the management and alteration of the problem causing distress in relation to the environment, as well as the reduction of stressful demands and expansion of resources in order to cope (Lazarus, 1993). Problem-focused processes involve active/direct coping; planning (e.g., strategies to change or control the stressor); suppression of competing activities (e.g., avoidance of distraction by other activities); restraint coping (e.g., passive strategy of not acting); and seeking instrumental social support (Lazarus & Folkman, 1984b). Folkman, Lazarus, Gruen, and DeLongis (1986) argued that problem-focused coping, compared to emotion-focused, is associated with better health outcomes.

Emotion-focused coping refers to the regulation, control and decrease of emotional response and distress, which is caused by a stressor, through behavioural and cognitive approaches (Lazarus, 1993; Lazarus & Folkman, 1984b). Emotion-focused mechanisms include seeking emotional social support; positive reinterpretation and reappraisal, acceptance, denial or avoidance of stressors; and turning to religion (Carver, Scheier, & Weintraub, 1989; Cohen & Hoberman, 1983; Endler & Parker, 1993; Endler, Parker, & Summerfeldt, 1998; Schaefer, Coyne, & Lazarus, 1981). Carver et al. (1989)

also highlighted three other coping mechanisms: behavioural disengagement and helplessness (e.g., giving up), focusing on and venting of emotions, and mental disengagement or self-distraction from thinking. Later, Carver (1997) added three more coping responses: humour, use of substances, and self-blame.

Successful adaptation to stressors can be achieved through five coping dimensions: reducing harmful external situations, tolerating or adjusting to negative life events, maintaining a positive self-esteem, keeping emotional balance and decreasing emotional distress, and upholding a satisfactory relationship with the environment or others (Cohen & Lazarus, 1979). Coping may be successful in one or more of these dimensions but adaptation may be short-lived (Cohen & Lazarus, 1979). Adaptation has been seen in the resistance stage of the GAS and in the theory of allostasis as the attempt of the organism to activate the physiological systems in order to adapt and deal with a stressor (McEwen, 1998b; Selye, 1956, 1976; Sterling & Eyer, 1988). Following anticipation and activation of stress response, adaptation enables the organism to recover and turn to its baseline stress level (Selye, 1956; Sterling & Eyer, 1988). Adaptation and coping need to be considered in order to explore the feasibility of distinguishing between ancient and modern stressors.

Before moving onto research concerning links between stress and physical health, relevant research about stress and emotions in general will be considered. Assessing the transactional model of stress, coping and emotions, Schachter and Singer (1962) conducted an experiment with 184 male college students, divided into an adrenaline-induced experimental group and a placebo-induced control group, to examine the physiological and psychological factors in relation to appraisal and emotion. They found that both cognitive and physiological factors elicit emotions and that individuals evaluate their emotional condition depending upon the physiological arousal. They concluded that a stressor motivates physiological arousal which in turn

elicits emotions. Cognitive appraisals have been also found that lead to several emotions in a sample of 122 female adult students when the same stressor was experienced suggesting that appraisals can be considered as sufficient sources of emotional responses to stressors (Siemer et al., 2007). Verduyn, Van Mechelen, and Tuerlinckx (2011) explored the cognitive factors that influence the duration of emotional experiences in 344 university students and concluded that these factors can prolong the duration of emotional experiences based on goals' congruence or incongruence.

Numerous studies have shown an association between appraisal of and coping with a stressor and emotional response suggesting that emotions arise from motive-consistent or inconsistent events (Dewe, 1991; Roseman, Dhawan, Rettek, Naidu, & Thapa, 1995; Roseman, Spindel, & Jose, 1990; Scherer, 1993; Wallbott & Scherer, 1986); and that shame and guilt arise from events appraised as important to the self (Reisenzein & Hofmann, 1990; Roseman, 1991; Roseman et al., 1990; Weiner, Graham, & Chandler, 1982). The latter two emotions constitute indicative examples of SCEs; SCE theory and research will be presented later in the chapter.

2.2.4 Stress and physical health

Having discussed the theories of stress, coping and emotions in relation to this research programme, the review will now move onto the presentation of the stress and health link to show the importance of stress and its significance in influencing physical health. The relationship between stress and health is influenced by several psychosocial, biological, cultural and physical factors as well as from the characteristics, severity and number of stressors, people's susceptibility and vulnerability, and coping (Engel, 1977, 1981; Kazarian & Evans, 2001; Schneiderman, Ironson, & Siegel, 2005).

Stress can have negative implications on physical health and leads to the onset and progression of illness (Herbert & Cohen, 1994). Stressful life events however, cannot constitute a sufficient single cause of developing pathology and an illness behaviour, but instead it is the transaction between an individual and their environment which potentially elicits health risks based on the transactional model (Lazarus, 1966; Lazarus & Folkman, 1984b). The physical impact of stress can range from a common cold and sleep problems to cardiovascular, digestive and endocrine diseases and lead to the experience of psychophysiological disorders, negative affectivity, depression and anxiety (Cohen, Doyle, Alper, Janicki-Deverts, & Turner, 2009; Cohen et al., 1995; Cohen et al., 1998; Friedman, Clark, & Gershon, 1992; Hammen, 2005; Kessler, 1997; Lazarus, 1993; McEwen & Stellar, 1993; McLaughlin & Hatzenbuehler, 2009). However, some researchers argue that stress is related to more common and frequent health problems than those that are more severe (Parker, Finkel, & Indice, 1993).

According to the diathesis-stress model, people's vulnerability and susceptibility to physical or psychosocial diseases is reliant upon their predisposition to the disorder (i.e. the diathesis) and their appraisal of stress (Steptoe & Ayers, 2004). Stress influences health indirectly through individual's behaviour (e.g., lifestyle) (Henderson & Baum, 2004; Lundberg, 1999; Schnall et al., 1990) or directly through changes in bodily physiology, decreases in immune system effectiveness and an increase in stress hormones (Baer, Garmezy, McLaughlin, Pokorny, & Wernick, 1987; Cartwright et al., 2003; Hall et al., 2004; Morrison & Bennett, 2009; Ng & Jeffery, 2003). Psychological stress has also been positively associated with the risk of developing physical health symptoms and increased vulnerability and susceptibility to physical illness (Cohen et al., 1995; Cohen, Tyrrell, & Smith, 1991; Cohen & Williamson, 1991; Lien, Rikard Haavet, Thoresen, Heyerdahl, & Bjertness, 2007; Pedersen, Zachariae, & Bovbjerg, 2010; Roghmann & Haggerty, 1973; Smith & Nicholson, 2001; Stone et al., 1992).

Previous research found that modern stressors were positively associated with increased HPA axis activity, which can further result in negative health implications according to the theory of allostasis and allostatic load (Schreier & Evans, 2003; Sterling & Eyer, 1988). This research programme will examine the relationship between life events and hassles, in the form of ancient and modern stressors, and physical health, and will explore whether physical health outcomes (i.e. cold symptoms) are best predicted by modern rather than ancient stressors. This work will not only extend the stress and health link, but it will also provide evidence in order to better understand this association in relation to ancient and modern stressors through the most recent theory of allostasis.

2.2.5 Allostasis and allostatic load

Psychoneuroimmunology (PNI) considers the immune system, psychophysiological stress responses to adaptation and health implications, and the inclusion of PNI further developed the transactional model with the theory of allostasis and allostatic load (Ader, 1980; Bottaccioli, Bottaccioli, & Minelli, 2018; Cohen & Herbert, 1996; Ramsay & Woods, 2014; Steptoe & Cohen, 1999; Sterling & Eyer, 1988). The organism (brain and body) attempts to adapt and deal with potential event stressors in order to keep homeostasis (Cannon, 1929; McEwen, 2007; Sapolsky, 1994; Sterling, 2012; Sterling & Eyer, 1988). Homeostasis is the active process through which the complex physiological systems (i.e. autonomic nervous system, neuroendocrine, cardiovascular, metabolic and immune systems) are kept within a narrow range, maintain the constant internal environment/milieu (e.g., blood pressure, blood pH, body temperature), adapt to physical and psychological stressors, and maintain one's physiological and behavioural stability (Karatsoreos & McEwen, 2011; McEwen,

1998b, 2007). The organism otherwise should alter all the parameters of its internal environment and fit them appropriately to environmental demands (Bernard, 1957; Cannon, 1932). Stress affects these physiological systems (e.g., acute stressors elevate heart rate); two major factors determine how people respond to stressful events: firstly individual's perception and appraisal of the stressor and secondly their general state of physical health (McEwen, 1998b, 2007; Wetherell & Vedhara, 2005).

Allostasis is the successful process of adaptation to stressors through change in order to stabilise homeostasis. Allostasis is a more complex regulation process than homeostasis as it involves the whole brain and body rather than simply local systems. The organism perceives a stressor and attempts to adapt to it through biological, behavioural and physiological responses in order to achieve allostasis (McEwen, 2007). The physiological systems and HPA axis are seen as adaptive, which respond to several different physical conditions (e.g., noise, overcrowding, temperature extremes, awakening, physiological alterations by infection) (Engert et al., 2017; Karatsoreos & McEwen, 2011; McEwen, 1998b; McEwen & Wingfield, 2003; Murison, 2016; Ramsay & Woods, 2014; Schulkin, 2003; Sterling & Eyer, 1988).

Allostatic load (accumulated lifetime stress) is the result of unsuccessful adaptation to repeated intense stressors or the sustained activation of the allostatic systems. This results in an imbalance and wear and tear of the bodily allostatic systems that accumulate over time and therefore do not enable these systems to adapt and cope with potential future stressors (Goldstein & McEwen, 2002; McEwen, 1998b, 2006, 2007; McEwen & Stellar, 1993; Murison, 2016; Sterling, 2012; Sterling & Eyer, 1988). Allostatic load is the product of four cases: first the physiological allostatic systems overreact (i.e. frequent activation); second they fail to adapt and deal with multiple stressors (i.e. lack of adaptation to repeated hits); third these systems might overwork as they fail to shut off after their failure to deal with the stressor (i.e. prolonged response)

which results in trauma and chronic stress conditions (e.g., post-traumatic stress disorder; PTSD); and fourth due to an inadequate response that results in the hyperactivity of other systems (Karatsoreos & McEwen, 2011; McEwen, 1998b, 2007; McEwen & Stellar, 1993). Seeman and Gruenewald (2006) argued that the risk of allostatic load increases as people age due to immunosenescence (i.e. natural and gradual ageing of the immune system) resulting in greater susceptibility and vulnerability to physical health outcomes (Aw, Silva, & Palmer, 2007; Bauer, 2013).

The theory of allostasis/allostatic load, which considers the physiological, neuroendocrine and immunological interrelations, in conjunction with the transactional theory, which examines psychosocial and behavioural factors, suggest that the organism mobilises the whole body and brain in adaptation and coping when individuals perceive an imbalance in the person-environment transactions in order to achieve stability through change and positive health implications. Genetics, environmental, psychological, social, biological, behavioural, clinical, demographic and socioeconomic, neuroendocrine, immune and metabolic factors and biomarkers, childhood adversity and perceived stress, may have a negative impact on physiological adaptation and allostasis (Beckie, 2012). Inability to adapt and cope with stressors results in prolonged physiological stress arousal, wear and tear of systems, allostatic load and physical illness (Ganzel et al., 2010; Kupriyanov & Zhdanov, 2014b; McEwen & Gianaros, 2010; Sterling, 2012).

The notion of adaptation to stress is closely related to the theory of allostasis and allostatic load (McEwen, 1998b, 2007; Sterling & Eyer, 1988). Schreier and Evans (2003) also argued that repeated activation of adaptive allostatic systems to stressors can result in negative implications for the HPA axis, allostatic load and health. However, people might have been better-equipped to deal with stressors that have been an integral part of the human evolution (Schreier & Evans, 2003). Considering the transactional

model of stress and coping (ability/inability to cope) and the theory of allostasis and allostatic load in relation to the notion of adaptation (or inability to adapt), this research programme will explore the feasibility of distinguishing between ancient and modern stressors in relation to adaptation and coping. Based on work by Schreier and Evans (2003), it is believed that people will be more able to adapt and deal with ancient stressors resulting in favourable, event or emotion, outcomes and allostasis, rather than with modern stressors which might result in unfavourable outcomes and allostatic load.

To sum, a number of theories have been developed to evaluate the schemes and functions of appraisals, and the fact that different emotions arise from events' perceptions. Several components have also been added to the earliest theories and other parameters have been omitted due to their strengths, weaknesses and limitations (Arnold, 1960; Frijda, 1987; Oatley & Johnson-Laird, 1987; Ortony, Clore, & Collins, 1990; Scherer, 1984, 1988; Weiner, 1985). Despite its weaknesses that have been discussed, the transactional theory has been suggested to be one of the most complex, complete and flexible models as empirical evidence has provided consistent results (Dewe, 1991; Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Folkman, Lazarus, Gruen, et al., 1986; Rogers & Holmbeck, 1997; Schachter & Singer, 1962; Verduyn et al., 2011).

2.2.6 Ancient and modern stressors

Considering the evolutionary aspects of stress in relation to adaptation and coping with stressors that might result in allostasis or allostatic load, a novel and innovative conceptualisation of how stress affects physical health and well-being is the notion of ancient and modern stressors (Schreier & Evans, 2003). There are established psychological and physiological coping processes which enable individuals to adapt and

deal with ancient stressors; this implies an epigenetic element to stress coping. With more modern stressors people have had less time to adapt and needed more time and physiological energy to deal with them, resulting in a higher stress response, greater impact on physical health and higher allostatic load (McEwen, 1998b, 2007; McEwen & Stellar, 1993; Sterling & Eyer, 1988). Examples of ancient stressors are family arguments and death of a close family member, whereas modern stressors involve unemployment and financial problems (Schreier & Evans, 2003).

Regarding this research programme, the transactional model of stress, coping and emotions will be used in conjunction with the theory of allostasis/allostatic load, which incorporates the notion of adaptation, coping with stressors and health implications, in order to explore the feasibility to distinguish from a psychological perspective between ancient and modern stressors in relation to adaptation and coping, and their associations with SCEs and physical health; and to ideally draw conclusions about the ancient and modern stressors distinction in adulthood. A modified version of Folkman's model (1997) is used in this thesis and represents the application of the ancient and modern stressors, SCEs and physical health within these theories (Figure 2.2).

The shaded parts of the figure represent the transactional model. If an event is appraised as irrelevant or benign to one's well-being and goals, the person will ignore the stimulus and might express positive emotions. If an event is appraised as a stressor, loss, threat, harm or challenge, individuals will attempt to adapt and deal with it and possibly experience negative emotions through appraisals. This is where the ancient and modern stressors concept fits in and expands the transactional theory in conjunction with the theory of allostasis. This is visually shown on the figure by the light parts. According to the definitions, a stressor could be considered as ancient following an individual's successful adaptation and efficient coping and further resulting in allostasis.

However, unsuccessful adaptation and inefficient coping with a modern stressor would lead to allostatic load and physical health outcomes. It is the individual's perceptions and adaptive/maladaptive coping resources that would make a stressor moving along an ancient/modern continuum depending on stressor characteristics. If an individual would be able to adapt and deal with a stressor based on their appraisal, this stressor would move more on the ancient side of the continuum. If an individual would be less able to adapt and would need more time to deal with a stressor based on their appraisal, this stressor would move more on the modern side of the continuum. Younger and older adults' appraisals of life event stressors will be examined to identify characteristics and adaptive/maladaptive coping responses. This is to enable the feasibility of distinguishing between ancient and modern stressors regarding the transactional model and theory of allostasis. The figure also presents that ancient and modern stressors would elicit SCEs, if people's actions and behaviour are not congruent with their goals.

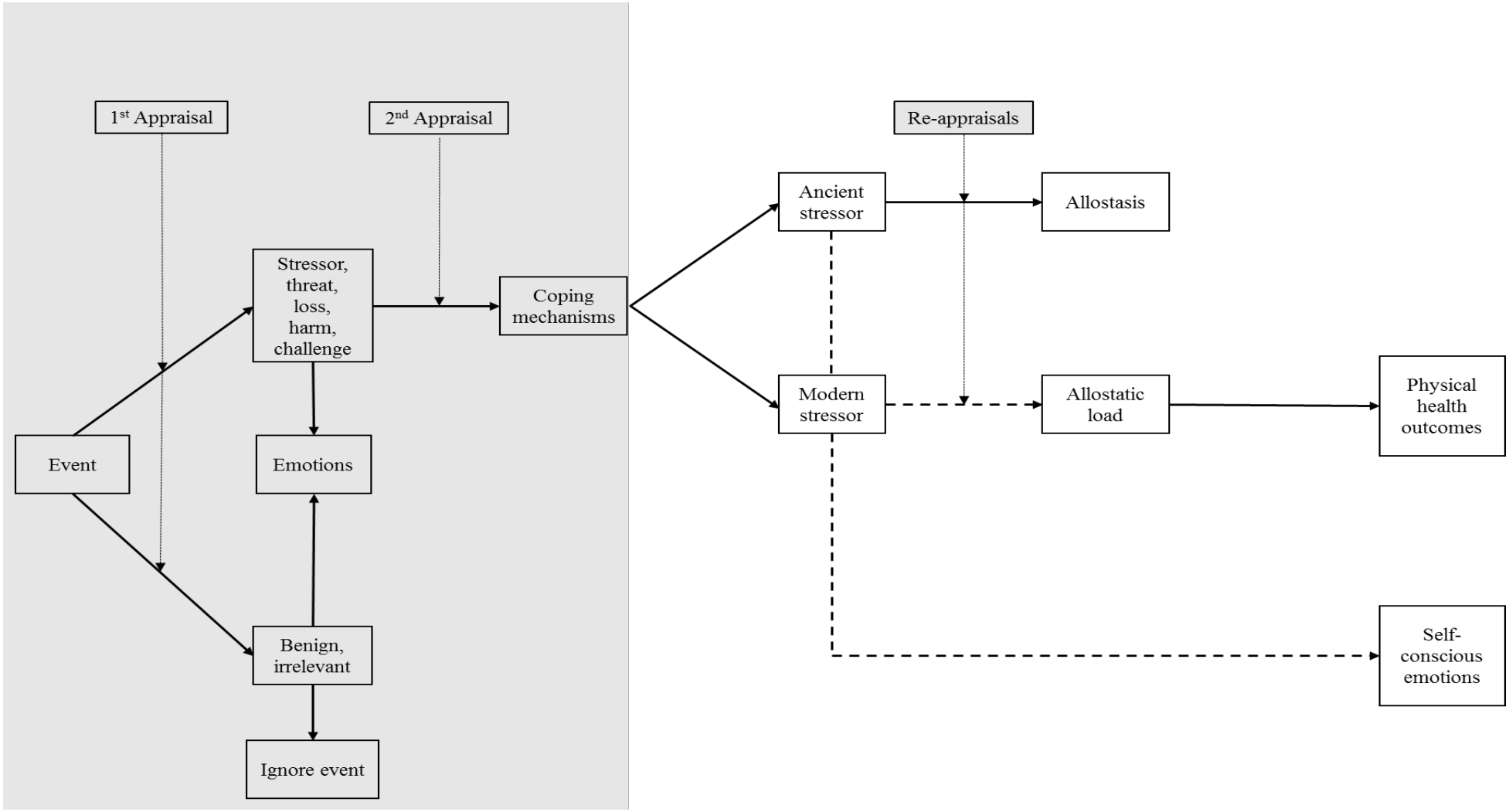

Figure 2.2. The transactional model of stress and coping modified to include ancient and modern stressors in relation to self-conscious emotions and physical health outcomes.

2.2.6.1 Overview of the Schreier and Evans's work

The initial idea of distinguishing psychosocial stressors as ancient and modern derived from the work by Schreier and Evans (2003). They examined children's exposure to stressors using a parental-report index, the Life Events and Circumstances checklist (LEC); the LEC was completed by mothers of children (*M*age = 9 years). The 32-item LEC, which was not originally developed to assess ancient and modern stressors, was used in order for mothers to indicate their child's exposure (yes/no) to several chronic stressors (i.e., poverty, family illness, violence, family turmoil, child separation from family) during children's lifetime. Five researchers independently categorised each stressor as ancient or modern; 12 stressors were classified as ancient and 10 stressors as modern (Schreier & Evans, 2003).

The purpose of Schreier and Evans (2003) study was to examine: firstly the relationship between early childhood exposure to ancient and modern stressors and child's HPA axis activity; and secondly the impact of ancient and modern stressors severity on HPA axis activity measuring overnight urinary cortisol. Constant elevated HPA axis activity is related to ill health and allostatic load (McEwen & Stellar, 1993). The mean frequency of stressors experienced by each child was six; three ancient stressors (i.e. child upset by family arguments; close family members have had serious arguments with each other; child has had to deal with people whose behaviour was frightening) and three modern stressors (i.e. close family member hospitalised for serious illness; close family member away from home a lot; parent lost his/her job or has been unemployed). Schreier and Evans (2003) found that early childhood exposure to modern stressors, and not to ancient, was significantly and positively associated with greater cortisol and HPA axis activity. They concluded that the effect of ancient and modern stressors on HPA axis activity cannot be ascribed to stressor severity; the mean

stressor severity ratings were 2.42 for ancient and 2.36 for modern stressors. This finding implies that stressor severity could not explain any differences in HPA axis activity. Thus, established psychophysiological coping mechanisms would enable individuals to adapt and deal with ancient stressors achieving allostasis, whereas inability to adapt and deal with modern stressors would result in allostatic load (Lazarus & Folkman, 1984b; McEwen, 1998b, 2007; McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling, 2012; Sterling & Eyer, 1988). Further to the transactional theory, coping can be divided into dispositional and situational strategies, which are often complementary. The former refers to stable (e.g., established) coping that people often employ to deal with stressors, and the latter refers to particular coping mechanisms that are changeable depending upon specific stressors (Ghadimi, Latif, Ninggal, & Amin, 2018).

The association that was found by Schreier and Evans (2003) between exposure to modern stressors and greater HPA axis activity constituted a stimulus for this research in order to extend it: to assess the feasibility of distinguishing between ancient and modern stressors. Schreier and Evans (2003) introduced a novel concept in stress research and their analysis of stress from an alternative anthropological and evolutionary perspective suggests a potentially new way of categorising stress, which would benefit from further examination from a psychological perspective. This transition from an anthropological/evolutionary to a psychological perspective will not only add a new stress categorisation to the broad picture of stress research, but it will also provide explanatory patterns and increase one's understanding of stress. Utilising the transactional theory and theory of allostasis, this research programme will explore firstly whether adaptation and coping enable people to deal more efficiently with ancient rather than modern stressors and achieve allostasis, and secondly the feasibility to distinguish between the stressors based on adaptation and coping. Before moving to

the research about stress and physical health, the next two sections discuss ancient and modern stressors from a psychoendocrine and neuro-anthropological perspective incorporating research from different fields that might enable a better understanding of the nature of these stressors.

2.2.6.2 The psycho-endocrine perspective

From a psychoendocrine perspective, in 1859 Darwin developed the theory of evolution suggesting that animals differentiate from each other not only in gender, but also within the same gender, as they adopt several behavioural responses and adapt differently to environmental changes. Darwin also stated that some organisms are more vulnerable to stress because of adaptive processes and personality traits. The Darwinian stress concept constituted the research basis of the behavioural and physiological stress responses (Korte, Koolhaas, Wingfield, & McEwen, 2005). Schreier and Evans (2003) considered these evolutionary and psychoendocrine aspects in order to introduce the concept of adaptation and coping in ancient and modern stressors suggesting that there are established psychophysiological coping processes for ancient but not for modern stressors. Interestingly, Korte et al. (2005) and Schreier and Evans (2003) examined this evolutionary perspective independently arriving at the same conclusion. This implies that there is an emerging interest from different research areas based on this notion; Schreier and Evans looked at a cross-sectional human sample whereas Korte et al. (2005) at different animal species.

Following an evolutionary perspective, Korte et al. (2005) found that different organisms adopt several behavioural stress responses (fight-flight versus freeze-hide) to deal with stressors in order to maintain allostasis, which further underlie their physiological and neuro-endocrinological operation. However, there are different

personality types and stress response differences between and within the same organisms. They explained the benefits of allostasis in health and the costs of allostatic load in the metabolic, immune, physiological, neuro-endocrinological and cardiovascular systems and the brain. They also argued that Type A personality individuals, who are more aggressive, hostile, competitive and impatient, are characterised by increased sympathetic reactivity and decreased parasympathetic and HPA axis reactivity. Type B personality people, who are more social and non-aggressive, are characterised by low sympathetic reactivity and high parasympathetic and HPA axis reactivity. Because of unsuccessful adaptation and coping with stressors, the former individuals may experience psychopathological symptoms (e.g., atypical depression, hypertension, cardiac arrhythmias, chronic fatigue, asthma, burnout, autoimmune diseases) and the latter may experience anxiety disorders, melancholic depression, insomnia, weight loss, infections, and metabolic syndromes (Korte et al., 2005). Schreier and Evans (2003) also found that exposure to modern stressors was associated with higher cortisol release and HPA axis activity.

The notion from Schreier and Evans (2003) that there are established psycho-physiological coping processes could also be supported by a very recent review from Contreras and Gutiérrez-Garcia (2018). They argued that the cortisol awakening response (CAR)- a typical diurnal 50% increase of cortisol occurring 30-45 minutes after morning awakening is followed by a steady decline in cortisol levels throughout the day (Fries, Dettenborn, & Kirschbaum, 2009; Pruessner et al., 1997)- constitute an ancient adaptive allostatic factor that prepares individuals to deal with potential stressors throughout the day. Thus, the CAR, which is closely linked to HPA axis activity, might enable people to adapt and deal with ancient stressors resulting in allostasis, whereas a prolonged cortisol response and HPA axis activation results in allostatic load and might be linked to modern stressors.

2.2.6.3 The neuro-psycho-anthropological perspective

According to evolutionary and anthropological medicine, the human brain adapts to ancestral social and environmental conditions (i.e. friendships and non-industrial societies) but faces difficulties in adapting to novel environmental situations (i.e. population density and industrial societies) that mismatch with the familiar ancestral past (Eaton et al., 2002; Li & Kanazawa, 2016; Tooby & Cosmides, 1990; Trevathan, 2007). This inconsistency in adaptation to ancient and modern life situations is likely to have negative health implications as "human biology is designed for Stone Age conditions" and less for modern (Williams & Nesse, 1991, p. 1). Thus, this statement accords with the notion from Schreier and Evans that ability to adapt and cope with ancient stressors, which have been an integral part of the human evolutionary history, might result in positive health implications (i.e. allostasis).

Additionally, a very recent review stated that evolutionary ancient adaptations to attachment, belonging to groups and collective identity result in social support which enables people to adapt and deal with stressors, such as physical health and illness, separation and distancing (Lehardy & Fowers, 2018). This argument accords with Schreier and Evans (2003) notion that there might have been established coping mechanisms that enable people to adapt and deal with stressors. Regarding this research programme, if this is the case, social support could be seen as an ancient adaptive coping mechanism, which would enable individuals to adapt and deal with life event stressors of physical health and illness.

According to evolutionary neuroscience and the triune brain model, MacLean (1990) argued that individuals are more likely to be able to adapt and deal with threats, life changes and challenges (e.g., feeding, dominance, starvation, physical integrity, physical hardship, homeostasis) that are similar to their ancient past due to the reptilian

and paleomammalian brain complexes of coping. The primitive and innate purpose of ancestors and modern people, who adapt and deal with familiar ancient challenges unconsciously and automatically, is to survive (MacLean, 1990). This automatic response towards threats, which is derived by the reptilian coping brain complex, appears to be the biological basis of the fight-flight stress response developed by Cannon and Selye in the 20th century. The more evolved, complex neomammalian coping brain might have equipped people with the ability to perceive, adapt and cope with stressors that mismatch with the ancestral past (Flinn, Nepomnaschy, Muehlenbein, & Ponzi, 2011; MacLean, 1990).

From a psycho-evolutionary perspective, Leary, Adams, and Tate (2006) stated that individuals have been evolutionarily prepared and predisposed to rely upon natural, spontaneous, automatic, and effortless hypo-egoic strategies in order to adapt and deal with familiar environmental Paleolithical-oriented demands. Hypo-egoic refers to individual's predisposed regulation of its behaviour, which requires some effort but it is not effortful and includes self-awareness (Martin et al., 2017). Yet with more modern threats people need to rely upon deliberate, controlled, effortful and conscious hyper-egoic processes, which are incompatible with people's evolved predispositions. This implies that inherited hypo-egoic predispositions appear to be sufficient and efficient for individuals to deal with ancient stressors but not adequate for modern stressors; modern stressors require hyper-egoic strategies which may result in a psychological cost (Martin et al., 2017). Schreier and Evans (2003) also made a similar point suggesting that it is the efficiency of coping that impacts the ability to deal with ancient stressors more effectively than modern stressors.

These different perspectives have been in line with the notion of ancient and modern stressors (Schreier & Evans, 2003), suggesting that individuals might have had

established coping mechanisms (e.g., hypo-egoic processes and an evolved paleomammalian coping brain), which enable them to adapt and deal with stressors that are more closely linked to their familiar ancestral past, rather than with more modern stressors which might result in negative health implications (i.e. allostatic load). This research has not only addressed the lack of ancient and modern stressors' research, but it has also explored evidence from several disciplines in order to add a new holistic insight to better understand stress.

2.3 Stress and physical health outcomes; using the common cold as a paradigm of acute ill health

Having presented the link between stress and health and discussed the potential association between ancient and modern stressors with health implications in relation to the theory of allostasis, adaptation and coping, this section will focus on presenting research regarding the relationship between psychosocial stress and physical health. In order to explore the association between stressors and physical health outcomes (in study two), this research programme will use the common cold as a paradigm of acute ill health characterised by short duration, sudden onset and rapid change or worsening of symptoms which can affect bodily systems (Macpherson, 2004; Murrow & Oglesby, 1996; Turner-Cobb, 2014). Individuals, who have experienced negative life events, perceived stress and inefficient coping, have been more likely to develop signs of upper respiratory tract infections (URTIs) and subsequently common cold, as laboratory studies have shown (i.e. the common cold is examined via intentional exposure to a common cold virus) (Cohen et al., 1998; Cohen et al., 1991; Cohen, Tyrrell, & Smith, 1993). Psychosocial stress has been positively associated with illness duration and susceptibility, and URTIs occurrence but not with illness frequency according to

naturalistic studies (i.e. the common cold is studied through medical records and verification of clinical examinations) (Boyce et al., 1977; Dohrenwend & Dohrenwend, 1974; Hamrick, Cohen, & Rodriguez, 2002; Lien et al., 2007; Rahe, 1975; Takkouche, Regueira, & Gestal-Otero, 2001; Turner-Cobb & Steptoe, 1996, 1998).

Previous work has found evidence between different stressors and populations on URTIs. For example, negative life events in 79 couples (Stone, Reed, & Neale, 1987), minor life events in 30 undergraduate students (Evans, Pitts, & Smith, 1988), and daily hassles in 75 couples (DeLongis, Folkman, & Lazarus, 1988) were found to be significantly correlated with the onset of URTIs. However, daily hassles, compared to life events, have been regarded as a better predictor of URTIs in a sample of 125 undergraduate students (Treharne, Lyons, & Tupling, 2001) and of the common cold in a sample of 100 adults (Evans & Edgerton, 1991). Graham, Douglas, and Ryan (1986) also found in a sample of 94 families, that two groups of individuals; those who were highly stressed and those who were female, were more likely to experience higher levels of URTI symptoms than their counterparts. This extensive previous research is important for the present research programme as it will explore common cold symptoms in relation to ancient and modern life events.

A review from Falagas, Karamanidou, Kastoris, Karlis, and Rafailidis (2010) concluded that psychosocial stressors are positively associated with the onset, progression and recurrence of physical health symptoms (i.e. acute respiratory tract infections; e.g. common cold) not only in ill individuals but also in those who are healthy. Acute stressors have been associated with the first type of allostatic load (i.e. inadequate allostatic response because of repeated stressors) in a longitudinal study with 260 participants (*M*age = 73.3 years) (Clark, Bond, & Hecker, 2007; McEwen, 1998b) and with increased susceptibility to physical illness in healthy adults (Cohen, Doyle, &

Skoner, 1999; Cohen et al., 1998; Cohen, Tyrrell, & Smith, 1993). Glei, Goldman, Chuang, and Weinstein (2007) also found a strong positive association between chronic stressors and allostatic load because of greater psychosocial vulnerability in 916 older adults using biomarkers such as adrenaline, noradrenaline, dopamine, cortisol, glucose and insulin.

Low socioeconomic status (SES) and childhood have also been significantly associated with acute physical illness and the function of HPA axis resulting in poorer health outcomes in adulthood (Blair, Raver, Granger, Mills-Koonce, & Hibel, 2011; Cohen et al., 2008; Repetti et al., 2011; Stelianides, Golmard, Carbon, & Fantin, 1999). Another study by Folkman, Lazarus, Gruen, et al. (1986) found a negative association between appraisals, coping and physical health in 150 adults, aged between 26 and 54 years; the more participants coped with a stressor, the poorer their well-being and the greater the psychological symptoms were. A suggested explanation of this finding was that the appraisals in person-environment transactions were likely to be changeable and not stable and that only a few stressors were examined.

The common cold will be used as a model of acute illness in study two of this research programme and its incidence in adults ranges from two to five common colds per year (Hall & McBride, 1988). The common cold causes a series of symptoms, such as rhinorrhoea, sore throat, nasal obstruction, nasal discharge, headache, sneezing, pharyngeal discomfort and cough, which last for about a week (Couch, 1990; Gwaltney Jr, 1997; Jackson, Dowling, Spiesman, & Boand, 1958; Lowenstein & Parrino, 1987; Stone et al., 1992). Psychosocial stress increases the susceptibility and vulnerability to the common cold and symptom severity, and vice versa (Cohen & Williamson, 1991; Friedman, Klein, & Friedman, 1996; Smith, 2013). The longer the duration of a stressor,

the greater the risk and susceptibility to the common cold are (Cohen et al., 1998; Takkouche et al., 2001).

Most of the previous research examined the relationship between stress and physical health focusing on several factors, such as perceived stress, life events, hassles, health behaviours, depression, anxiety, SES, demographics, positive and negative affect, mood and personality. Based on the finding that modern stressors were positively associated with greater cortisol and HPA axis activity (Schreier & Evans, 2003), study two of this research will explore the application of ancient and modern stressors in the URTI literature; a concept that has not been previously examined. According to the transactional model and theory of allostasis (Lazarus & Folkman, 1984b; Sterling & Eyer, 1988), it is predicted that modern rather than ancient stressors will be positively associated with common cold symptoms regarding inability to adapt and cope, resulting in allostatic load and further to negative health implications.

Previous studies recruited participants of several age groups but mainly adults. The first and the second study of this research programme will recruit participants of specific age groups; younger adults aged 18-24 years and older adults aged over 60 years respectively. The exploration of ancient and modern stressors in these two specific age groups will not only enable assessment of the feasibility of distinguishing between stressors in younger and older adults but also to draw potential conclusions in relation to stressors' appraisal, experience, adaptation and coping across adulthood. Previous research has also found gender and age differences in the relationship between psychosocial stress, coping and physical health in adults, thus studies one and two will explore gender and age differences in relation to ancient and modern stressors. Some of the previous studies recruited healthy participants, who were infected with laboratory viruses, to examine the association and impact of stressors and coping on URTIs using

questionnaires and diaries. The present studies will aim to recruit healthy participants to explore the distinction between ancient and modern stressors and their association with common cold symptoms and coping using questionnaires and interviews.

2.4 Stress and self-conscious emotions

Having already presented the appraisal theory of emotions in the transactional model of stress and coping (Lazarus & Folkman, 1984b), this section will focus on the theory and research of SCEs (see figure 2.2). The focus on SCEs in relation to ancient and modern stressors has derived from several reasons: firstly, SCEs are characterised by underlying evolutionary processes, as such ancient and modern stressors; for example, the distinction between shame and guilt relies upon the psychobiological factors which affect these emotions (Folger, Johnson, & Letwin, 2014; Gilbert & McGuire, 1998). Secondly, shame and guilt are also distinguishable by their adaptive and coping profile (Luyten, Fontaine, & Corveleyn, 2002), as such Schreier and Evans (2003) recommended for ancient and modern stressors. Thirdly, shame experience has been associated with increased stress reactivity (e.g., heightened cortisol release) and modern stressors have been associated with higher cortisol release and HPA axis activity (Lewis & Ramsay, 1997, 2002; Miller, Chen, & Zhou, 2007; Schreier & Evans, 2003). Fourthly, according to the transactional model in relation to the emotional response, people's appraisal and ability to adapt and deal with ancient stressors are not expected to elicit high levels of negative SCEs, as these emotions will not constitute the product of their actions and behaviour towards the stressors.

SCEs are a distinct and special class of emotions which include self-representations and one's consciousness of others' reactions, and are drawn from self-perception, self-evaluation and self-reflection (Bulger, 2013; Tangney & Dearing,

2003). They arise when people decide whether the appraisal of events and perception of self constitute the outcome of their actions depending upon their own characteristics (Lewis, Sullivan, Stanger, & Weiss, 1989; Robins & Schriber, 2009).

Shame is described as the failure to live up to an ego ideal and as self-deficiency; guilt is characterised by a moral imperative transgression and self-responsibility; authentic pride about a behaviour (i.e. beta pride) is regarded as the enhancement of ego identity receiving credit for a valued object or achievement; hubristic pride about the self (i.e. alpha pride) is considered by self-exaggerated unseemly vanity and arrogance associated with detachment and unconcern; envy refers to the will of possessing what someone else owns; embarrassment is a mild form of shame which often occurs in the presence of others and triggers a specific physiological response involving the activation of the sympathetic nervous system; and externalisation of blame assigns the cause of a negative action or behaviour to other factors or people whereas self-blame involves internal self-attributions of shame and guilt (Cairns, 1996; Janoff-Bulman, 1979; Lewis, 1971; Lewis, Takai-Kawakami, Kawakami, & Sullivan, 2009; Robins & Schriber, 2009; Smith & Lazarus, 1993; Tangney, Miller, Flicker, & Barlow, 1996; Weiner, 1985). Gender differences have been found in SCEs; girls are more likely to hold others responsible for an achievement and themselves responsible for a failure compared to boys who do the opposite (Lewis, 1995).

The experience of SCEs is not represented by any facial expression compared with other emotions. For example, when one feels proud others cannot recognise it from their facial expression but instead they can from bodily posture and movements. Also, SCEs are initially experienced during early childhood (between 18 and 24 months) compared to the basic emotions that are experienced in infancy (Beer & Keltner, 2004;

Folger et al., 2014; Lewis, 2007; Tangney & Dearing, 2003). SCEs rely upon two important cognitive factors: the self is recognised as separate and individually unique from others; and the self and behaviour are assessed by internal, external and social standards (Fischer & Tangney, 1995; Lewis et al., 1989). This argument supports Darwin's idea that SCEs develop as a result of the self being the centre of attention of others (Lewis, 2007).

2.4.1 SCEs as traits

As with other emotions, SCEs can be considered as either state or trait. State is individuals' temporary emotional and/or behavioural change at a particular time and is characterised by instantaneous emotional, physical, behavioural, cognitive and psychological reactions to internal and/or external stimuli. Traits are permanent, habitual and internally-caused patterns of emotions and behaviours, which are long-lasting and stable over time, affect behaviours and include individual differences (Tangney & Dearing, 2003). State SCEs are drawn from emotional experiences and are transitory dispositions; trait SCEs are provoked by dispositional tendency (i.e. shame-proneness regarding negative events; guilt-proneness for specific behaviours) (Bulger, 2013).

This research programme will examine SCE traits as people's evolutionary emotional dispositions might constitute a characteristic to distinguish between ancient and modern stressors by their SCE adaptive/maladaptive coping profile (Tangney, Burggraf, & Wagner, 1995; Tangney & Dearing, 2003; Tangney, Dearing, Wagner, & Gramzow, 2000; Tangney, Wagner, & Gramzow, 1992). The SCEs of shame and guilt have been mainly examined in previous research. It is predicted that negative SCEs will

be elicited from modern stressors due to individual's self-evaluation of their inability to deal with these stressors.

2.4.1.1 Shame and guilt

Two of the most important existential SCEs are shame and guilt, which are moral, socially-constructed, negatively-balanced and self-referential emotions which include internal attributions. They are drawn from how people are viewed by others, require an internalised objection of self because otherwise people strictly judge themselves, and are driven by self-blame (Duncan & Cacciatore, 2015; Lazarus, 2006; Tangney, 1991, 1995).

2.4.1.1.1 Shame

Shame is an affective SCE drawn from internal, stable and global attributions, which detrimentally affect interpersonal behaviour and is typically associated with feelings of shrinking, hiding, escaping and disappearing, being physically small and inferior, isolation, worthlessness and powerlessness (Tangney & Dearing, 2003). It is suggested to be the most stressful, devastating and challenging emotion to deal with (Lazarus, 2006). Shame often arises when individuals evaluate their actions as a failure with regard to their standards, goals, fulfilment of their ego ideals, and results to a global attribution (Piers & Singer, 1971). Experience of shame is associated with self-blame and blame of others (i.e. externalisation) about negative events; distress; expression of anger and hostility; and sometimes with less empathy of others' behaviour (Lewis, 1971; Lewis, 1995; Tangney, 1990, 1992, 1993; Tangney, Wagner, Fletcher, & Gramzow, 1992). In shameful situations, young adults are likely to feel that they have

less control over these situations; individuals are also likely to feel observed by others and to be highly aware and concerned about others' opinions (Tangney, 1992; Tangney & Dearing, 2003).

2.4.1.1.2 Guilt

Guilt, compared to shame, is suggested to be a less painful but ego-threatening SCE, which stems from internal, specific and less stable attributions because people's primary concern is a particular behaviour. It is usually associated with tension, remorse, regret and responsibility about an immoral thing that has been done; more proneness to empathise; self-blame; and results from a particular attribution. Individuals judge their behaviour as a failure focusing on specific moral self-traits (Lewis, 1971; Lewis, 1995; Piers & Singer, 1971; Tangney, 1992; Tangney, Miller, et al., 1996; Tangney, Wagner, Hill-Barlow, Marschall, & Gramzow, 1996). People are often seen as self-decentred focusing on the impact of negative behaviour on others and keeping the self integrated and unified (Tangney, 1993). Guilt is usually in relation to an event as opposed to shame which can be more of a non-specific, generic emotional response (Tangney & Dearing, 2003). Individual, personality and gender differences have been found in guilt regarding the impact and appraisals of moral illegitimate transgression (Ausubel, 1955; Izard, 1991).

2.4.1.1.3 The distinction between shame and guilt

The experience of shame focuses directly on the evaluation of the global entire self and elicits self-oriented distress, whereas guilt focuses on the negative assessment of behaviours that results in a negative self-evaluation. However, the self is less

impaired in guilt than in shame (Lewis, 1971). Uji, Kitamura, and Nagata (2011) stated that emotional-oriented coping is used towards shame-proneness, and task and avoidance-oriented coping towards guilt-proneness. The assessment of shame and guilt is demanding because both are exclusively internal experiences which are not amenable to direct observation and also their distinction is problematic.

Shame (i.e. self) is described as "*I* did that horrible thing" (focusing on the 'I' which is the ashamed self) and is related to "characterological self-blame"; guilt (i.e. behaviour) is described as "I *did* that horrible *thing*" (focusing on the 'did thing' which represents a guilty behaviour) and is related to "behavioural self-blame" (Else-Quest, Higgins, Allison, & Morton, 2012, p. 948; Tangney, Stuewig, & Mashek, 2007, p. 5). A positive association has been found between externalisation of blame with shame and a negative association with guilt (Tangney, 1990). Individuals are likely to mentally undo parts of the ashamed self and aspects of the guilty behaviour (Tangney & Dearing, 2003). A systematic review also concluded that different neurobiological brain areas are activated in shame and guilt (Bastin, Harrison, Davey, Moll, & Whittle, 2016).

Shame and guilt can be experienced in life events related to lying, cheating, stealing, failing to help, disobeying parents, breaking up an intimacy, having sexual dysfunctions and infidelity. They are likely to be elicited by moral lapses and violations of social conventions in life settings. However, shame is more likely to arise from non-moral failures and shortcomings than guilt (Tangney & Dearing, 2003). Shame activates reactions that exclude a negative event whereas guilt mobilises responses towards and against an event (Roseman, 1994). Guilt is a more adaptive moral emotion than shame, as individuals are likely to be more able to deal with it compared to shame (Luyten et al., 2002).

Shame and guilt have been found to account for adults' experiences with regard to negative events and behaviours. Despite this, no evidence has been found that shame is a more negative public emotion than guilt through assessment of adult SCE experiences (Tangney, Hill-Barlow, et al., 1996; Tangney, Wagner, et al., 1996). However, a modest decrease was found in shame-proneness form early to middle adulthood. Developmental psychologists argue that there is a constant change in the nature and functions of SCEs across lifespan (Fischer & Tangney, 1995; Lewis et al., 1989; Muris & Meesters, 2014). Regarding this research programme, study two, which will explore shame and guilt experiences in ancient and modern stressors, might identify SCE experience differences between younger and older adults.

2.4.1.2 Research on stress and SCEs

Having presented the theory and research around stress and emotions in general as well as the SCE theory, this section will present relevant research about life event stressors and SCEs. Research has focused on the physio-psychosocial aspect of the relationship between stress and SCEs. For example, Dickerson, Kemeny, Aziz, Kim, and Fahey (2004) found that healthy young adults, who blamed themselves and experienced traumatic events, reported higher scores of shame and guilt and of cortisol release compared to participants who experienced neutral life events. Dickerson, Mycek, and Zaldivar (2008) also found that 89 undergraduate student participants reported shame, and demonstrated greater cortisol increase and HPA axis activation in social-evaluative tasks.

In line with these findings, a meta-analysis by Miller et al. (2007) found that chronic life event stressors (e.g., unemployment, bereavement) were associated with increased HPA axis activity, cortisol levels and shame. Although shame might not have

been an important determinant of the HPA axis, an interpretation provided by this meta-analysis was that shame, which was associated with elevated afternoon/evening cortisol levels and was likely to be elicited in stressful social/self-evaluative situations, might have implications for health and wellbeing (Miller et al., 2007). A suggestion from these findings in relation to this research programme is that higher levels of shame and guilt would be associated with modern stressors, as these stressors can result in greater HPA axis activity considering stressor and individual's characteristics (Miller et al., 2007; Schreier & Evans, 2003).

Positive associations have also been found in life event stressors between shame-proneness and guilt-proneness with psychological problems in adults (Muris, 2015; Muris & Meesters, 2014), such as anxiety and depression (De Rubeis & Hollenstein, 2009; Grabe, Hyde, & Lindberg, 2007; Muris, Meesters, Bouwman, & Notermans, 2015; Rohleder, Chen, Wolf, & Miller, 2008; Sjöberg, Nilsson, & Leppert, 2005); anger, aggression and hostility (Åslund, Leppert, Starrin, & Nilsson, 2009; Bear, Uribe-Zarain, Manning, & Shiomi, 2009; Furukawa, Tangney, & Higashibara, 2012; Heaven, Ciarrochi, & Leeson, 2009; Stuewig, Tangney, Heigel, Harty, & McCloskey, 2010); sadness (Bennett, Sullivan, & Lewis, 2010); PTSD (Feiring, Taska, & Lewis, 2002); eating disorders and anorexia nervosa (Berghold & Lock, 2002); antisocial behaviour and low self-esteem (Olthof, 2012); and chronic pain (Efthim, Kenny, & Mahalik, 2001; Uji et al., 2011). Shame-proneness has been found to be positively associated with psychological and physical health outcomes rather than guilt-proneness in 156 female undergraduate students (Pineles, Street, & Koenen, 2006).

Additionally, a positive association between SCEs and anxiety was found in 726 undergraduate participants (Schoenleber, Chow, & Berenbaum, 2014). A longitudinal study by Turner-Cobb, Michalaki, and Osborn (2015) found that 64 adults suffering

from chronic pain, compared to 63 healthy adults, experienced higher levels of shame and guilt. Males have also been likely to be more able to deal with shame than females (Pivetti, Camodeca, & Rapino, 2016). A recent study from Stotz, Elbert, Müller, and Schauer (2015) found a relationship between shame and guilt and accumulated lifetime stress in 32 male refugee minors, aged 11-20 years, which could have a detrimental impact on mental health. This finding was consistent with other studies (Hagenaars, Fisch, & van Minnen, 2011; Lee, Scragg, & Turner, 2001) suggesting that high levels of shame and guilt constitute a risk factor of mental health related to accumulated stress.

This previous research has extensively provided some grounded evidence regarding the association between SCEs and health implications. Interestingly, the majority of these studies examined shame and guilt, a few of them examined blame and embarrassment, and even fewer explored pride. In addition, little work has been done about SCEs and physical health in relation to life event stressors. Studies one and two of this research programme will be the first to aim to fill this lack of research exploring associations between SCEs (specifically, shame and guilt) and cold symptoms in relation to ancient and modern stressors. Based on the transactional model and theory of allostasis, it is predicted that individuals will experience higher levels of shame and guilt and common cold symptoms in modern rather than ancient stressors because of individuals' inability to adapt and cope which might result in allostatic implications (Lazarus & Folkman, 1984b; Schreier & Evans, 2003; Sterling & Eyer, 1988). Lastly, this programme will explore whether ancient and modern stressors could be distinguishable by their SCE profile.

2.4.2 Implications of stress, SCEs and health outcomes regarding ancient and modern stressors

This section aims to integrate previous research about stress, SCEs and cold symptoms in relation to ancient and modern stressors and the overall aim of this research programme. SCE experiences and stress responses constitute factors that influence individuals' ability or inability to adapt to life events (Zautra, 2006; Zautra, Berkhof, & Nicolson, 2002). Healthy individuals are likely to report lower levels of shame and guilt compared to people suffering from mental illnesses (Rüsch et al., 2007). MacAulay and Cohen (2014) claimed that SCEs experience had an impact on daily skills of patients with severe mental diseases. Dysfunction in their ability to deal with daily tasks had an impact on independent living and household, financial and occupational responsibilities, communication, interpersonal and family relationships, planning and being organised, transportation, legal and health concerns. They found that patients reported significantly higher levels of shame and worse QoL than a control group and concluded that shame is negatively associated with QoL. Similar findings between affective traits and QoL have also been found in non-clinical populations (Lyubomirsky, King, & Diener, 2005). This previous research shows the association between SCEs and health outcomes in a wide range of life events. Study one aims to examine relationships between ancient and modern stressors, in the form of similar life events (e.g., interpersonal and family relationships, health concerns), with SCEs; and study two associations between the stressors, shame and guilt, and cold symptoms.

As with the experience of stress, SCE experiences not only impact psychosocial factors but also physiological. Threats to the social self that elicit SCEs have an impact on the HPA axis physiological reactions, which regulate the release of the stress hormone cortisol (Bulger, 2013). Repeated experience of shame has been found to

increase stress reactivity through underlying biological mediators (e.g., it heightens cortisol release and lowers serotonin) (Gilbert, 2000; Gilbert & McGuire, 1998; Gruenewald, Kemeny, Aziz, & Fahey, 2004; Lewis & Ramsay, 1997). Chronic or persistent experience of shame can have a detrimental impact on mental health, such as depression (Lewis, 1971; Scheff, 2001), social anxiety (Gilbert & Trower, 1990; Trower, Gilbert, & Sherling, 1990), and suicidal concept (Mokros, 1995). Stress reactivity and intensity (e.g., greater cortisol response) has also been associated with the intensity and frequency of SCEs (Lewis & Ramsay, 1997). Greater cortisol response to stress and higher expression of shame result in a negative self-evaluation (Lewis & Ramsay, 2002). Thus, it would be expected that shame would be positively associated with modern rather than ancient stressors, as modern stressors have been positively associated with higher levels of HPA axis activity (Miller et al., 2007; Schreier & Evans, 2003) as well as because of people's inability to deal with these stressors which might lead to negative emotional responses (Lazarus & Folkman, 1984b).

Some work has found that in contexts of negative self-evaluation, adult women are more likely to express more shame and guilt than men. Under stressful life events, males report shame and guilt in contexts that reflect physical inadequacy, emotional inexpressiveness, subordination to women, intellectual inferiority, sexual inadequacy, and failure to meet masculine standards. Females experience shame and guilt in situations which include emotional detachment, physical unattractiveness, victimization, unassertiveness, failed nurturance, lying, and competitive performance circumstances (Efthim et al., 2001; Lewis & Ramsay, 2002). Regarding the present research, it is predicted that female adults will experience higher levels of shame and guilt than males in ancient and modern stressors.

Social-evaluative stressors (e.g., giving a talk in the presence of an audience) have also been found to elicit SCEs, especially shame, which activate the HPA axis that then releases stress hormones (Dickerson, Gruenewald, & Kemeny, 2004; Dickerson & Kemeny, 2004; Gruenewald, Dickerson, & Kemeny, 2007; Kemeny, Gruenewald, & Dickerson, 2004; Miller et al., 2007). From a physiological perspective, increases in levels of cortisol, heart rate, blood pressure and negative mood have also been found to be associated with exposure to an anticipated, controlled, laboratory manipulated by researchers but novel for participants, social-evaluative acute stressor (i.e. mock job interview and mental arithmetic tasks assessed by a panel) in a sample of 23 healthy young adults (*M*age = 20.2 years) compared with those levels in a typical day. Increased levels of cortisol could be considered as an adaptive coping mechanism towards an expected challenging stressor (Wetherell, Lovell, & Smith, 2015). In such a case and based on the work from Schreier and Evans (2003), it would be expected that adaptation and coping will enable individuals to deal with ancient stressors, whereas with more modern stressors increased and potentially sustained levels of cortisol could result in maladaptive coping, allostatic load and health implications (McEwen, 1998b; Sterling & Eyer, 1988).

A study with 50 healthy young adults (*M*age = 19.6 years) found that cognitive critically-evaluated multi-tasking stressors/tasks, when individuals needed to simultaneously respond to several life event-representative stressors, were associated with increased levels of heart rate, blood pressure and anxiety; decreased positive mood; but not with cortisol response. This suggested that cortisol followed its normal typical diurnal decline while performing a multitask (Wetherell, Craw, Smith, & Smith, 2017). Additionally, another study examined whether experience of repeated exposure to an acute naturalistic stressor could result in decreased cortisol reactivity in 24 novice and experienced skydivers (*M*age = 28 years). It was suggested that habituation with a

stressor does not constitute a part of experience, and that novice and experienced skydivers did not differ in relation to their cortisol reactivity profile (Hare, Wetherell, & Smith, 2013).

From a psychological perspective in relation to ancient and modern stressors, it is predicted that individuals would be likely able to deal with an expected and controlled ancient stressor, such as multi-tasking stressors and skydiving due to established psycho-physiological coping mechanisms. With a non-anticipated, uncontrollable, novel and multiple modern stressor, individuals might be less able to adapt and deal. Studies one and two, also driven from the findings of the latter study (Hare et al., 2013), will explore whether ancient and modern stressors could be differentiated regarding adults' experience with stressors. One of the differences between the aforementioned studies and this research programme is that studies one and two will focus on the exploration and distinction of life events as ancient or modern.

Dickerson, Kemeny, et al. (2004) also argued that shame and self-blame increase proinflammatory cytokine activity (i.e. the immune defence of the organism against antigens) (Evans et al., 2000), which can worsen the progression of physical health. Chronic shame experience, repeated activation of the HPA axis and proinflammatory cytokine activity increase susceptibility to diseases (Kronfol & Remick, 2000; McEwen, 1998a). Self-reported state shame was not associated with cortisol stress responses after exposure to an acute stressor in 44 young adult students. However, trait shame was positively associated with cortisol responses and females reported higher levels of shame stress responses suggesting that shame may predict HPA axis activation and lead to negative stress-related health implications (e.g., allostatic load) (Lamont, 2015; Lupis, Sabik, & Wolf, 2016).

Life event stressors have been found to increase cortisol release and SCEs experience resulting in persistent HPA axis activation and allostatic load (Dickerson, 2008; Miller et al., 2007). The experience of SCEs constitutes a central mechanism for the organism to appraise, adapt and deal with stressors (Dickerson, Gruenewald, & Kemeny, 2009; Ganzel et al., 2010). Also, the brain acts as a mediator in order to control emotional responses to deal with stressors (McEwen & Gianaros, 2010). Negative emotional disclosure that is caused by stressful life events can lead to prolonged physiological arousal and allostatic load, whereas expression of positive emotions shows readiness to stress adaptation and allostasis (Danner, Snowdon, & Friesen, 2001).

Stressful life events that elicit negative SCEs have been found to weaken the immune system and increase the risk, vulnerability and susceptibility to infectious rhinoviral diseases (e.g., the common cold) (Cohen, Kaplan, Cunnick, Manuck, & Rabin, 1992; Cohen et al., 1991; Cohen & Williamson, 1991). Cohen, Doyle, Turner, Alper, and Skoner (2003) assessed the relationship between positive and negative emotions and susceptibility to the common cold. They concluded that high levels of positive emotions were associated with less likelihood to get a common cold, and that negative emotions were not associated with the common cold because of individual differences. These studies presented the growing basis of the relationship between SCEs, stress responses and health implications from a physiological perspective (Gruenewald et al., 2004; Lewis & Ramsay, 2002). This research programme aims to explore life event stressors, SCEs and physical health in relation to ancient and modern stressors from a psychological perspective.

2.5 Summary

This chapter followed a top-down logic in order to present the general concepts of stress, SCEs and physical health. It specifically focused on critically presenting theories and previous research about the interconnection between the transactional theory of stress and coping; the theory of allostasis and allostatic load; psychosocial factors in the form of life events and hassles; shame and guilt; the common cold as a paradigm of acute physical illness; and ancient and modern stressors in adults' everyday life. In the current literature, stress research relies upon the field of PNI, which examines the association between not only psychosocial but also physiological, neuroendocrine and immune factors with HPA axis activity, stress reactivity and physical health. The theory of allostasis and allostatic load that further developed Lazarus and Folkman's transactional theory considers both the body and the brain as fundamental components in appraisal, adaptation and coping with stressors and experience of emotions.

With the existence of only one published article about ancient and modern stressors and from an anthropological perspective, this concept is novel, innovative and unexplored in psychological stress research. This research programme is the first to explore the feasibility of distinguishing between ancient and modern stressors. Studies one and two, with younger and older adults respectively, examined the relationship between SCEs and ancient and modern stressors as well as gender and age differences. According to previous research, SCEs (specifically shame and guilt) might constitute a factor that would enable a distinction to be made between ancient and modern stressors. It was expected that modern rather than ancient stressors would be associated with SCEs experience. People might negatively evaluate the self and actions towards their inability to adapt and deal with modern stressors as these stressors have been regarded

as more recent to human evolutionary history than ancient stressors. Study two also examined the relationship between ancient and modern stressors and cold symptoms; modern stressors were expected to be more closely associated with common cold symptoms than ancient stressors. Such an association would indicate that ancient stressors are more closely related to the notion of adaptation, coping and allostasis, whereas modern stressors might result in allostatic load. Lastly, study three explored whether ancient and modern stressors could be also distinguished at an innate, implicit level. It was expected that ancient stressors would be unconsciously associated with ability to cope and modern stressors with inability to cope. Having reviewed the literature in relation to this research programme, the next chapter will present and discuss the methodology of this research programme.

Chapter Three: Methodology

3.1 Chapter overview

This chapter will discuss the epistemology of quantitative and qualitative research focusing on the mixed methods research and study design with particular reference to pragmatism as the approach taken in this research. This chapter will also discuss quantitative and qualitative methods of data collection in relation to stress, how these strategies were complementary and how data were integrated in a mixed-methods approach. Methodological and practical issues as well as solutions will be presented, along with the relevant ethical considerations for this research programme.

3.2 Epistemology

Prior to presenting the epistemology and approach that were considered in relation to this specific research programme, some general methodology terms will firstly be presented in general. Philosophical assumptions, such as epistemology and ontology, consist of beliefs, assumptions, values and practices (worldviews or paradigms) that address inquiries. Worldviews introduce ontology (nature of reality), epistemology (legitimate knowledge; how we know what we know), axiology (what is the role of values in research), methodology (research procedure) and rhetoric (inquiry's language) (Crotty, 1998; Guba & Lincoln, 2005; Kuhn, 1970; Ramazanoglu & Holland, 2002; Tashakkori & Teddlie, 2010; Tebes, 2005). Quantitative research has been often characterised by the epistemological worldviews of positivism and post-positivism; qualitative research has been often formed from the paradigms of naturalism and constructivism; and mixed methods from pragmatism and realism (Burr, 2006;

Creswell, 2009; Gergen, 1985; Popper, 2002). However, qualitative research can be also underpinned from post-positivism (Michell, 2004).

3.2.1 Quantitative and qualitative research

Quantitative research measures and collects quantifiable data setting prior hypotheses and using questionnaires, quantitative surveys and experimental tasks, which are statistically analysed. Through post-positivism, which has been often seen as a deterministic worldview which disputes "the absolute truth of knowledge", the unbiased researcher deductively collects data about a single reality (Braun & Clarke, 2013; Creswell, 2009; Davidson & Tolich, 2003; Phillips & Burbules, 2000, p. 3). Qualitative research collects non-numerical data (e.g., words, photos, video diaries) to "explore a problem, honour the voices of participants, map the complexity of the situation, and convey multiple perspectives of participants" using for example interviews, focus groups, observations and qualitative surveys based on ethnography, grounded theory, case studies, phenomenological and narrative research (Breakwell, 2008; Creswell & Plano Clark, 2011, p. 7; Greig, Taylor, & MacKay, 2012). Naturalism and constructivism claim that there is no true reality but instead the world is made of the meanings and interpretations of people (Forrester, 2010; Morgan, 2007; Silverman, 2013).

However there is a timeless debate between quantitative and qualitative supporters, from which mixed-methods research emerged. Pragmatists argue that quantitative research is not always driven from post-positivism and qualitative research is not always underpinned from constructivism. Both methods can be mixed and integrated through pragmatism in order to provide a more holistic understanding of knowledge (Onwuegbuzie & Leech, 2005). In the present research programme, both

post-positivism and constructivism were adopted when conducting quantitative and qualitative research. A post-positivism stance was taken in order to deductively assess whether the theory of the topics of interest would explain the findings in a single reality in order to verify or contradict a theory (i.e. the existence of ancient and modern stressors). Additionally, a constructivist stance enabled to inductively explore several aspects (realities) of a phenomenon (i.e. ancient and modern stressors) in order to use participants' views and build upon a theory. Thus, a pragmatist approach enabled to consider both inductively and deductively the reality as both single and multiple.

Having introduced and discussed the different epistemologies that underlie quantitative and qualitative research, the discussion will now move onto mixed-methods research which is the main approach taken in this research programme. The next section will present how quantitative and qualitative research can be mixed, and how mixed methods have been applied in this research programme.

3.2.2 Mixed methods research

Mixed-methods research is the third methodological stance of collecting, analysing and reporting findings focusing on research design orientation, philosophical assumptions and methods of inquiry (Mertens, 2014). Depending upon the research questions, design and methodology, mixed methods integrate and combine both quantitative and qualitative strategies and data at various stages providing a more complete and holistic approach when conducting a study than either quantitative or qualitative research can offer separately; balancing one another; supporting each other and overcoming each one's limitations (Creswell, 2009; Tashakkori & Teddlie, 2010).

Pragmatism is the philosophical problem-centred, pluralistic and real world-oriented epistemological paradigm which typically underlies mixed-methods research

and focuses on what the research problem is rather than the methods employed, and how to freely use and combine all available and suitable methods to gain knowledge about the problem (Creswell, 2009; Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010). Pragmatism and critical realism refer to intersubjectivity whereby there might be a single real world or several realities for which people have their own interpretations, and transferability which asks to what extent the knowledge that researchers gain can be applied to other settings (Creswell & Plano Clark, 2011; Lincoln & Guba, 2000; Madill, Jordan, & Shirley, 2000; Morgan, 2007).

There are researchers who are in favour of combining quantitative and qualitative methods (Guba & Lincoln, 2005; Morgan, 2007), those who are against this argument because these methods are drawn from different paradigms (Sale, Lohfeld, & Brazil, 2002), and those who support the mixing and compatibility of methods as long as there is no combination across the paradigmatic assumptions (Smith & Heshusius, 1986; Yardley & Bishop, 2015). The latter argued that both methods could be applied in the same study provided that a positivist stance would be taken for quantitative methods and a constructivist stance for qualitative methods (Morgan, 2007). Pragmatism has been regarded as the way to acknowledge, address, clarify and resolve the epistemological differences between quantitative and qualitative approaches; it sees both approaches as not being incompatible and incommensurable in order to share a mutual purpose for research: to enhance the knowledge and understanding of reality and generate positive consequences for the world (Bishop, 2015; Tashakkori & Teddlie, 2010; Yardley & Bishop, 2008).

However, there is a counter argument that pragmatism is not the unique worldview that could be used in mixed-methods research and that researchers could use contradictory worldviews (Greene & Caracelli, 1997). Multiple paradigms in mixed-

methods research adopting a pluralistic approach could be employed in order to answer the research question (Greene & Caracelli, 1997; Tashakkori & Teddlie, 2010). Another argument against mixed methods states that in a sequential design the worldview can change from the first to the second part of the study whereas in a concurrent design the same worldview could be adopted as post-positivism and constructivism perceive the reality and knowledge of a phenomenon differently (Creswell & Plano Clark, 2011).

Others believe that quantitative, qualitative and mixed-methods approaches are outdated and for that reason research should allow "a rebirth of research from the ashes of mixed methods" (Silverman, 2013; Symonds & Gorard, 2010, p. 1; Tashakkori & Teddlie, 2010). Mixed methods have been regarded as a type of multimethodology (multi-methods). Different types of data are collected and analysed but differ regarding whether the methods are dependent (in mixed-methods) or independent (in multi-methods) from each other (Tashakkori & Teddlie, 2010). In this research programme, the quantitative and qualitative methods are part of the overall research, they are dependent upon one another within and between the studies and therefore the findings cannot be interpreted separately.

Mixed-methods designs being defined as fixed or emergent depend on whether the use of mixed methods is planned or emerges during the research. Two approaches that can be used in fixed or emergent designs are: typology-based which focuses on the selection and application of the most appropriate design from mixed-methods designs (e.g., initiation or development, experimental or naturalistic, complementary); or dynamic which emphasises the research process considering several components (e.g., the purposes, research questions and methods of study) (Creswell, Plano Clark, Gutmann, & Hanson, 2003). There are four main typology-based designs: explanatory and exploratory which are sequential, and triangulation and embedded which are

concurrent; a sequential explanatory typology-based design was followed in this research programme with a fixed design to take place in the first part of study one and study two, and an emergent design in the second part of study one. In mixed methods, four aspects should be considered: timing, weighting, mixing and theorising (Bazeley, 2009; Greene, 2007; Morse & Niehaus, 2016; Teddlie & Tashakkori, 2009).

First, timing of quantitative and qualitative methods can be sequential, employing first a quantitative method and secondly a qualitative to test and explain a concept in detail, or concurrent, both quantitative and qualitative methods occur simultaneously; other timings have been also suggested such as a multiphase designs, transformative or convergent parallel. Second, weighting refers to the priority and emphasis or equality given to either the quantitative or qualitative method following an inductive or deductive approach, or using some data as supportive of the main method; the first part of study one prioritised a quantitative method, and the second part of study one and study two gave equal priority to both quantitative and qualitative methods. Third, data mixing can be used at several stages of research, for example in methods, data collection, analysis and interpretation, based on the research purpose; data mixing in this research occurred in the analysis and interpretation of the second part of study one and study two. Fourth, theorizing refers to whether a theoretical framework underlies the design of the study (i.e. ancient and modern stressors) (Bishop, 2015; Caracelli & Greene, 1993; Creswell, 2009; Guest, MacQueen, & Namey, 2012).

3.2.2.1 Mixed methods in the current research programme

The rationale to use mixed methods in this programme of research derives from the key features of mixed methods (Bryman, 2006; Creswell & Plano Clark, 2011; Greene, Caracelli, & Graham, 1989; Tashakkori & Teddlie, 2010):

- A second method is needed to enhance one type of data which may not be sufficient to explain initial findings; a qualitative approach was considered in conjunction with a quantitative approach in studies one and two in order to address the research problem, understand and explain quantitative results, and enable the generalisation of findings. Methodological eclecticism and paradigm pluralism allowed the selection and integration of the most appropriate mixed-methods techniques and epistemologies in order to explore the topics of interest. For example, the quantitative methods helped to elucidate whether self-conscious emotions (SCEs) were an important component of ancient and modern stressors (in studies one and two), and the qualitative methods enabled exploration and a deeper understanding of the role that SCEs play in the experience of ancient and modern stressors; using such a mixed-methods approach further develops a conceptual distinction between these stressors.
- Collection and analysis of both quantitative and qualitative data in mixed methods enables the methods to build upon each other within a study and from study to study through triangulation emphasising the diversity of mixed-methods within and between studies. For example, in this research programme the psychological characteristics for ancient and modern stressors that were found in the qualitative analysis of study one informed the design of the mixed-methods study two.
- Explanatory results should be explained and generalised; quantitative and qualitative findings complement and enhance each other in order to discuss and generalise the overall findings of a topic that has not been previously examined, such as ancient and modern stressors in this research.
- The selection of methods should focus on the research question and aims that are needed to be examined through multiple phases in order to ensure completeness and credibility; each one of the three studies of this research programme consisted of its own aims, objectives and research questions that were considered through quantitative

and qualitative approaches. Eventually, all three studies were able to accomplish the overall purpose of this research: to explore the feasibility of distinguishing between ancient and modern stressors.

- A cyclical approach, which consists of both inductive and deductive (i.e. abductive) logical thinking, can be applied in the same study. This was the case in study one of this research which consisted of quantitative and qualitative methods; an inductive approach was employed in the first part of the qualitative analysis of study one to identify life event stressors that were encountered by adults, and a deductive approach was taken in the second part of the qualitative analysis of study one to explore characteristics of these life event stressors.
- A set of research designs for each individual study and the overall research define the points whereby the quantitative-qualitative mixing occurs in order to answer the research question. Regarding this research, this key characteristic will be discussed in the next section.

Therefore, mixed methods provide a more robust rationale and holistic, objective and subjective, and abductive way to examine a research problem than using a quantitative or qualitative method alone (Creswell & Plano Clark, 2011; Sale et al., 2002; Tashakkori & Teddlie, 2010). It allows researchers to employ several worldviews, paradigms and methods to test the hypotheses and answer the research questions, and it minimises the weaknesses of individual methods. In mixed methods, the researcher is required to have appropriate skills to conduct high quality quantitative and qualitative research, to be aware of the time needed and resources available to collect and analyse data, and to provide a convincing rationale for employing this approach (Bishop, 2015; Yardley & Bishop, 2015).

3.2.2.1.1 Research designs of the current overall programme

A sequential explanatory design that was consisted of two phases in studies one and two employed an abductive pragmatic approach (Morgan, 2007). As shown in figure 3.1, regarding part one of study one, the emphasis was given to the quantitative phase which was followed up with the supportive qualitative phase. A deductive qualitative approach was also employed in part two of study one and equal priority was given to both quantitative and qualitative data. The mixing of quantitative and qualitative data occurred in the qualitative phase of part two of study one in order to answer the research question, discuss the findings, and design study two. Regarding study two, equal emphasis was given to both quantitative and qualitative data integrating the data in analysis and discussion. The integration of findings from studies one and two informed the design of study three, which focused on quantitative methods employing a post-positivism approach. The overall programme of research employed a multiphase design combining and mixing both quantitative and qualitative strands within and between the studies over time in order to assess the distinction between ancient and modern stressors (Bishop, 2015; Morse, 1991, 2003; Morse & Niehaus, 2016; Sandelowski, 2003; Yardley & Bishop, 2008).

The design of this research programme maintained the integrity of both methods and connected quantitative and qualitative findings for interpretation, although some challenges should have been considered. In relation to the length of time required to conduct two phases, this research first completed the quantitative data collection allowing more time for data collection of qualitative phases in studies one and two; the selection criteria for participation in the second phases of studies one and two were based upon the quantitative analyses as participants were drawn from the highest and lowest sample's quartiles (i.e. a subset of the same sample participated in qualitative

phases); the sample sizes in quantitative phases were based upon power analysis; and each study stated its research question, which followed from the overall programme's aim and findings from the previous study (Creswell et al., 2003; Morgan, 1998).

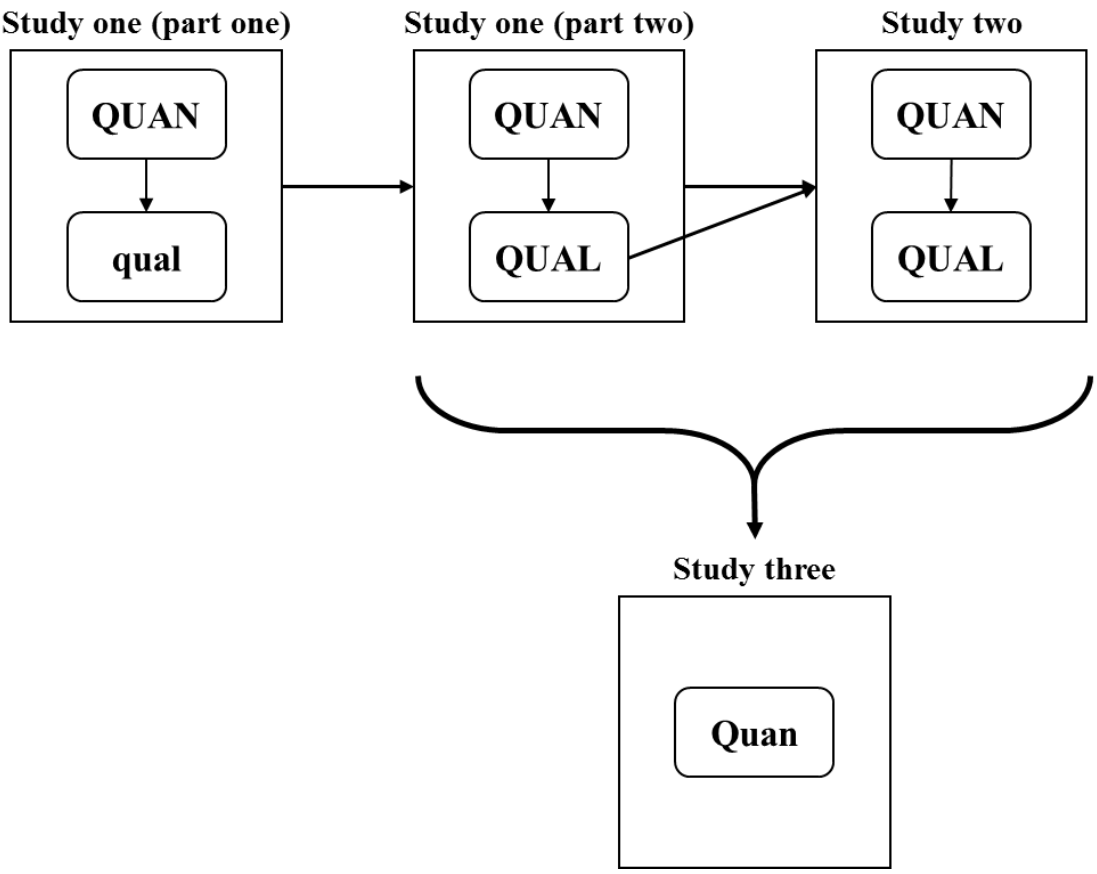

Figure 3.1. Diagram of the sequential explanatory (studies one and two) and quantitative (study three) research designs, which form an overall multiphase design in this research programme. Capitalisation of words designates the priority of the research.

3.3 Methods for measuring stress

The discussion will now move from the different methodologies to the research methods that have been used to collect data about stress and the specific methods that were used in relation to this research programme. Several approaches have been used to measure stress in naturalistic or laboratory settings, which consist of the assessment of physiological arousal using bodily biomarkers, standardised questionnaires, interviews

and experimental laboratory testing (e.g., Trier Social Stress Test (TSST)) (Buske-Kirschbaum et al., 1997; Dickerson & Kemeny, 2004; Kirschbaum, Pirke, & Hellhammer, 1993). The epistemological assumptions that underlie social sciences and specifically stress research rely upon the research questions, design and methods, rationale for data collection and analysis, and interpretation of findings (Johnson, Onwuegbuzie, & Turner, 2007; Onwuegbuzie, Johnson, & Collins, 2010).

Reviewing the different methodological approaches in stress research the distinction between acute and chronic stress should be considered as different methods are appropriate for different types of stress. Acute stress is short-term, time-limited and its onset can be caused by natural stressors or hassles and from events that are rare but cataclysmic; the characteristics of acute stress can also be recreated in the laboratory (e.g., mental arithmetic tasks, public speaking). Chronic stress lasts a long time and can be caused by chronic intermittent events (e.g., financial problems, weather), chronic persistent events (e.g., permanent disabilities, chronic job stress), sudden cataclysmic events (e.g., bereavement, death), and major natural disasters and terrorist attacks (Lazarus & Folkman, 1984b; Morrison & Bennett, 2009; Sarafino & Smith, 2014). This research programme aims to explore both acute and chronic life events (e.g., hassles, financial problems, bereavement) in relation to ancient and modern stressors.

3.3.1 Methods to measure ancient and modern stressors

This programme of research employed both quantitative and qualitative approaches to explore ancient and modern stressors. Regarding the quantitative methods, a series of questionnaires and an implicit paradigm were used to examine stressors, and regarding the qualitative methods, interviews were conducted to explore psychological stressor characteristics. Although there are a range of standardised

questionnaires (e.g., Social Readjustment Rating Scale (SRRS), Major Stressful Life Events) and interviews (e.g., UCLA Life stress Interview, Life Events and Difficulties Schedule (LEDS), Life Events Interview) to measure stress, the next section will focus on the rationale and specific measures that were used in this research programme (Brown & Harris, 1989, 2012; Cohen et al., 1991; Holmes & Rahe, 1967; Kanner et al., 1981; Rao, Hammen, & Daley, 1999; Wagner, Abela, & Brozina, 2006; Wethington, Brown, & Kessler, 1995).

3.3.1.1 Questionnaires to measure ancient and modern stressors

The Life Events Inventory (LEI), which generally refers to chronic stress, was used in this research to identify what life events adults have encountered and found stressful in their lifetime (Tennant & Andrews, 1976). Additionally, the Hassles and Uplifts Scale, which generally examines acute stress, was used to examine which minor life events adults experienced and found stressful in their daily life (DeLongis et al., 1988). Regarding this research programme, both scales need to be considered because firstly there is no ancient and modern stressors measure; secondly this is the first research to examine ancient and modern stressors from a psychological perspective; thirdly there is limited previous evidence to suggest that these stressors derive from either or both life events and daily hassles, and chronic or acute stress; and fourthly a wide range of life event and hassle items are provided. Lastly, the Perceived Stress Scale (PSS) was used as a more generalised measure of chronic stress to assess whether adults' perceived stress is associated with life events and hassles regarding ancient and modern stressors (Cohen, Kamarck, & Mermelstein, 1983). All scales are presented in detail in chapter four.

3.3.1.1.1 Questionnaires to measure SCEs

This research programme also examined associations between SCEs with ancient and modern stressors, as described in the literature review chapter. The Test Of Self-Conscious Affect-3 (TOSCA-3) was used in study one of this research because first it assesses a wide range of SCEs (e.g., shame and guilt-proneness, externalisation (blame), detachment/unconcern, pride); second it examines the likelihood of SCEs experience in adults; third it assesses SCEs as trait emotions identifying whether SCEs reflect one's self-evaluation towards ancient and modern stressors; and fourth it has been recently used to examine the relationship between SCEs and chronic pain experience (Tangney & Dearing, 2003; Turner-Cobb et al., 2015).

In study two, the focus moved towards the assessment of specific SCEs (i.e. shame and guilt) for two reasons: first, as outlined in the literature review, the majority of stress research has considered only these two key SCEs; and second the findings of study one suggested that shame and guilt have been experienced in relation to ancient and modern stressors. The Internalised Shame Scale (ISS) (Cook, 1988) and the Guilt Inventory (GI) (Jones, Schratter, & Kugler, 2000) were used to assess the intensity and experience of shame and guilt respectively in adults, and whether ancient and modern stressors could be distinguishable by their SCEs profile. The TOSCA-3 is described in detail in chapter four, and the ISS and GI in chapter six.

3.3.1.1.2 Questionnaire to measure physical health

This research programme also examined associations between physical health outcomes and ancient and modern stressors. As outlined in the literature review, an extensive research has been conducted about the association between stress and URTIs in adults (Cohen et al., 1999; Cohen, Tyrrell, Russell, Jarvis, & Smith, 1993; Falagas et

al., 2010; Turner-Cobb & Steptoe, 1996). The Common Cold Questionnaire (CCQ) (Jackson et al., 1958) and the Wisconsin Upper Respiratory Symptom Survey (WURSS-21) (Barrett et al., 2009) were combined and used to measure the experience and severity of acute physical health symptoms of the common cold in relation to stressors (see chapter six).

3.3.2 Implicit Association Test (IAT)

Having discussed the epistemological assumptions and methods to measure stress regarding ancient and modern stressors and before moving onto the qualitative methods that were used in this research, this section will introduce a well-established method, which has been used extensively in social and cognitive areas of psychology, and was innovatively employed and applied to assess stress concepts in study three (see chapter seven). The IAT is a computer-based task that measures the strength of implicit associations between concepts and evaluations across a range of populations and contexts. It has been regarded as a more authentic tool than questionnaires due to the fact that it is an experimental task which examines unconscious and automatic processes, which are closer to individuals' true attitudes, compared to self-reports which examine explicit and controllable responses (Greenwald, McGhee, & Schwartz, 1998; Greenwald, Nosek, & Banaji, 2003; Lane, Banaji, Nosek, & Greenwald, 2007; Nosek, Greenwald, & Banaji, 2005). In this research, the use of IAT assessed implicit associations between ancient and modern stressors in a way that has not been previously used and the self-report questionnaires are not likely to provide.

3.3.3 Interviews

The last method that was used in this research programme to assess the feasibility of distinguishing between ancient and modern stressors was semi-structured interviews. The use of interviews in studies one and two enabled i) the identification of psychological characteristics of ancient and modern stressors; ii) the examination of a range of different responses of what adults were thinking and feeling about stressful events and why; and iii) the exploration of whether adaptation and coping could provide evidence to designate stressors as ancient and modern.

Face-to-face one-on-one in-person interviews allow the researcher to regulate the questions and encourage participants to provide historical records, views and opinions through open-ended questions (Bogdan & Biklen, 1992; Merriam, 1998). Semi-structured interviews enable the researcher to not completely adhere to the interview protocol regarding either the exact phrasing of questions or the order the questions follow (i.e. flexibility). This provides participants with the opportunity to raise and discuss issues important to them that the researcher would not expect (Rubin & Rubin, 2011). Semi-structured interviews, although time-consuming, offer rich and detailed data but not always broad; they provide the researcher with a greater authority than the interviewees thus an expert profile should be avoided and an empathetic profile be adopted; they are considered as appropriate for discussing sensitive issues and mainly require a few interviewees (Braun & Clarke, 2013).

There have been some structured qualitative interview protocols which explore stress, life events and hassles in adults focusing more on clinical diagnostic purposes and mental health (e.g., psychopathology, PTSD, depression, schizophrenia) rather than physical health (Foa, Riggs, Dancu, & Rothbaum, 1993; Norman & Malla, 1993; Paykel, Emms, Fletcher, & Rassaby, 1980; Pelcovitz et al., 1997). Other semi-

structured interviews have also explored acute life stress and physical health in young adults (Raposa, Hammen, Brennan, O'Callaghan, & Najman, 2014); the relationship between SCEs and adverse health problems (i.e. chronic obstructive pulmonary disease) (Harrison, Robertson, Goldstein, & Brooks, 2017) and anxiety disorder (Schoenleber et al., 2014); the association between life event stressors, serotonin transporter and depression in adults (Kendler, Kuhn, Vittum, Prescott, & Riley, 2005); and the evaluative interaction between stressful life events' questionnaires and follow-up interviews in young adults (Lewinsohn, Rohde, & Gau, 2003). For the purposes of this research, there has been a need to develop an interview protocol which would specifically assess ancient and modern stressors, coping, SCEs experience and cold symptoms.

An interview protocol consisted of well-organised questions and prompts enabled the researcher to build trust and rapport with the participants. Questions flowed logically (i.e. sequence) and wording was considered; in these interviews the term appraisal of stressors was avoided and instead participants were asked how they thought and felt about stressful life events. The researcher was always aware of and acknowledged interviewees' distress when they discussed and disclosed personal experiences about stressful events (Braun & Clarke, 2013). Although participants were asked to discuss life event stressors, this was not the case in the present research as they not only disclosed personal experiences of stressors without hesitation, but they were also willing to discuss these experiences in greater detail and depth.

Critically reflecting on the methodological and ethical challenges of interviews in the present research, the researcher wanted to gain a holistic understanding of adults' views on ancient and modern stressors, adaptation, experience and coping with stressors, SCEs and physical health symptoms. Although the research process was

collaborative between the interviewer and interviewee, the researcher's beliefs might have had an impact on the topics discussed, findings and conclusions. For example, in the interviews of study two the researcher might have been influenced by the qualitative findings of study one in order to cover specific topics. This was avoided as the researcher let the interviewees partially control the flow of the interview; this resulted in interviewees answering questions before these having been asked. Lastly, the majority of interviewees were middle-class white participants, therefore there should have been some inter-subjectivity between the researcher and participants of sharing potentially similar meanings about stress.

3.4 Analysing and integrating mixed methods data

3.4.1 Quantitative analysis

Quantitative data such as questionnaire responses and computer-based tasks can be analysed through descriptive and inferential statistics in SPSS. In order to analyse the present data using correlations, multiple regressions (in studies one and two) and variations of ANOVA (i.e. Repeated-measures and Univariate) (in study three) specific assumptions must be met in data screening: independent and dependent variables should be continuous variables measured at interval level; adequate sample size; missing data; univariate and multivariate outliers can be checked based on the criterions suggested by Tabachnick and Fidell (2007); there should be no constraints on the variability of the outcome; and the assumptions of normal distribution and normally distributed residual errors (i.e. Mahalanobis distance between ±3.3); independent errors (i.e. Durbin-Watson statistic between 1.5-2.5); no perfect multicollinearity should be detected by looking for correlations over 0.9 and the collinearity statistics (i.e. VIF values over 10 and tolerance values under 0.1); linearity and homoscedasticity (i.e. through oval shaped patterns in

the variables from residual and scatter plots); singularity; independence of observations; equality, and homogeneity of variance (Dancey & Reidy, 2011; Field, 2013; Ghasemi & Zahediasl, 2012; Hair, Black, Babin, & Anderson, 2010; Tabachnick & Fidell, 2007). G*Power has been used to calculate an appropriate sample size for each study with an estimated medium effect size of 0.15, power of 0.80 and alpha of 0.05 (Cohen, 1992).

3.4.2 Qualitative analysis

Qualitative data can be coded by hand or using a computer qualitative data analysis software; the former was used in the present research due to several factors such as the purpose, scale and research questions of studies; data type and analytic approach; time that is required to learn a new software; risk of distancing from data, over-coding and promoting other analysis methods of data; and researcher's familiarity and comfort (MacMillan & Koenig, 2004; Mangabeira, 1995; Mangabeira, Lee, & Fielding, 2004). There are several analytic methods which aid the analysis of qualitative data, such as thematic analysis, interpretative phenomenological analysis, grounded theory, content analysis, discourse analysis (Guest, MacQueen, et al., 2012; Guest, Namey, & Mitchell, 2012). In the present programme of research, the qualitative approaches that were used were selected due to their flexibility to be applied across several theoretical and epistemological stances.

3.4.2.1 Thematic analysis (TA)

TA is a method to analyse qualitative data and to identify implicit and explicit themes and meanings of a phenomenon or some features of it. MS-Word software and hand-written notes have been used to transcribe, organise and analyse the qualitative

data. Although TA is a newer approach compared to the more established methods (e.g., phenomenology, ethnography, grounded theory, discourse analysis), it has been one of the most widely used, rigorous and flexible qualitative analytic methodological approaches. It can provide a realistic, practical, transparent, proficient and ethical focus regarding theoretical framework, methodology, epistemology, research questions, data collection and sample size (Guest, MacQueen, et al., 2012; Guest, Namey, et al., 2012). TA can be inductive (bottom-up: themes are strongly connected with data and generate theoretical concepts), deductive/theoretical (top-down: data are theory-driven and explore an existing theory), experiential or constructivist (Braun & Clarke, 2006; Guest, MacQueen, et al., 2012). In the first part of study one, an inductive TA was employed to look for common patterns across the data.

Braun and Clarke (2006) have described the six stages of thematic analysis: transcription and familiarisation with the data, generation of initial codes, theme search, theme review, defining and naming themes, and writing up the analysis. Data coding can be employed completely across the whole dataset or selectively. In this research, the data were completely coded due to the limited ancient and modern stressors research and all possible themes were explored to answer the research questions. The data were first data-derived (i.e. descriptive) to explore different meanings and later researcher-derived (i.e. interpretative) to identify implicit meanings; when coding was completed, higher and lower-order themes were identified and created. Data extracts (i.e. participants' quotes) were used to illustrate and interpret themes; interpretation moves from a simple description of what participants said to a discussion of what has been found and why (Braun & Clarke, 2013).

However, the weaknesses are that TA is not closely tied to a theoretical approach such as interpretive phenomenological analysis; it does not have interpretative

power because it lacks a solid guidance and theoretical foundation compared to other approaches; and it does not focus on language (such as discourse analysis) and on similarities or differences among participants as it looks for patterns (Birks & Mills, 2015; Braun & Clarke, 2006; Parker, 2005; Potter & Wetherell, 1987). In this research programme, TA was employed (see chapter four) to i) identify which psychosocial factors younger adults found stressful; ii) investigate the reasons why a series of life events and hassles have been experienced as stressful; iii) explore how males and females dealt with the stressful psychosocial factors; iv) what SCEs adults experienced. TA enabled to provisionally designate psychosocial stressors as ancient and modern according to adults' adaptation and coping.

3.4.2.2 Content analysis (CA)

This research has also involved a qualitative CA in part two of study one and study two (see chapters five and six). The inductive exploratory TA did not provide sufficient evidence to distinguish between ancient and modern stressors, as will be discussed in chapter five. This is why, a deductive CA was employed to i) explore in more depth the underlying context of adults' qualitative data; ii) provide a plausible justification and a high level of confidence; and iii) identify criteria (i.e. psychological characteristics) which enabled to provisionally distinguish between ancient and modern stressors.

CA constitutes a systematic, rule-guided analysis of text passages along with quantitative CA (i.e. presentation of frequency tables) in order to find evidence that builds and supports an argument. CA has been described as "a technique which lies at the crossroads of qualitative and quantitative methods" and "allows a quantitative analysis of seemingly qualitative data" (Kondracki, Wellman, & Amundson, 2002, p.

224). The stages of CA are: preparation of data; identification of category definitions from theory; reading and annotations for each interview transcript; decontextualisation and categorisation: coding and categorisation of data; recontextualisation and categorisation: review of categories to ensure that the data is appropriately coded and categorised; compilation: providing explicit definitions, examples and coding rules for each deductive category with regard to the theory in order to determine under what circumstances a quote can be placed in a category; and producing a report (Mayring, 2014; Vaismoradi, Turunen, & Bondas, 2013).

There are three different approaches that can be followed: conventional, summative or directed (Hsieh & Shannon, 2005). This research employed a directed approach; categories were coded based on a theory or previous findings that might require further investigation, such as the concept of ancient and modern stressors. Based on the research question, coding can either identify and categorise all aspects of a phenomenon or immediately categorise all aspects in the prescheduled categories. In the present research, both routes were followed; decontextualisation of text and identification of characteristics, which were categorised in the prescheduled groups. The limitations of a directed strategy are: it is more likely to find supportive than non-supportive evidence for the theory; participants may answer the questions in such a way to satisfy the researcher; and focusing on the theoretical aspects might lead the researcher to miss important contextual features of the phenomenon (Hsieh & Shannon, 2005).

CA analysis can be broad (i.e. a manifest analysis) or deep (i.e. a latent analysis). In the former, the researcher describes what the participants say using their own quotes; in the latter, the researcher attempts to find what is hidden in the underlying text and how this is interpreted (Bengtsson, 2016). An inductive CA can be

used when there is no previous knowledge of a phenomenon and how it is constructed. A deductive CA is used to test previous theory in different circumstances or in a new context, or to compare categories in different time periods; it provides explicit definitions, anchor examples and coding rules for each category created to explain exactly under what circumstances a passage can be coded in a category; the category system emerges from theory and previous research that has been set up before the coding. A deductive latent approach has been employed in this research to explain in greater depth the findings regarding ancient and modern stressors in line with existing theory (Elo & Kyngäs, 2008; Forman & Damschroder, 2007; Hsieh & Shannon, 2005; Mayring, 2014; Vaismoradi et al., 2013).

CA is a flexible theory-guided and a methodologically-controlled approach as the data are analysed in a very strict step-by-step process. Its weaknesses are (Insch, Moore, & Murphy, 1997; Kondracki et al., 2002):

- the researcher's bias and inability to infer causality and explain why a relationship might exist; this was not the aim of this research's analysis.
- the deficiency of interpreting an explorative and interpretative case study, although the analysis of the present research drew meaningful interpretations and explanations about the psychological characteristics that underlie ancient and modern stressors.
- the absence of generalising the findings beyond the text passages included in the analysis; this has been thoroughly discussed in the next chapters that any interpretations and generalisation of findings about ancient and modern stressors should be made with caution due to the novelty of this concept.

- the selection of text to be analysed and exclusion of other context or nonverbal language; CA was applied to all text passages without excluding any context in order to identify all possible instances of the phenomenon.

3.4.2.2.1 TA and CA distinction

TA and CA are quite similar regarding the stages and depth of data analysis, underlying epistemological paradigms and broadness of interpretations. The key difference is that in CA there is an additional focus on the analysis of the content of each data item using a coding system and on frequency of the codes in the text, i.e. "quantification of data" (diagrams with frequency in percentages of the ancient and modern psychological stressor characteristics will be presented in chapters five and six); whereas in TA the focus is on the identification of themes through immersion (Braun & Clarke, 2006; Kondracki et al., 2002; Vaismoradi et al., 2013, p. 398). A pragmatic stance can be followed in both analyses as the themes/categories constitute expressions of the content (Graneheim & Lundman, 2004). Regarding the present research, both analyses were considered as appropriate to answer the relevant research questions of the topic of interest.

3.4.3 Mixed methods analysis

It has become evident from the discussion about mixed-methods epistemology and approaches that quantitative and qualitative data can be mixed, integrated and interpreted at various points in research. Mixed methods can be synthesised through aggregation which focuses on thematically similar results to confirm the findings of each approach and produce a pooled summary, or through configuration which refers to

dissimilar results that can be clustered coherently and produce a theory or model (Sandelowski, Voils, & Barroso, 2006; Sandelowski, Voils, Leeman, & Crandell, 2012). Research synthesis enables the researcher to take an overall critical stance and make conclusions on the topic of interest. In this research, aggregation was employed to analyse, synthesise and pool quantitative and qualitative findings, and to confirm or refute the mutual purpose of assessing a phenomenon generating the most meaningful interpretations for each study and the overall research (Sandelowski et al., 2006; Sandelowski et al., 2012).

3.5 Quality criteria for mixed methods

Quality criteria refer to validity and reliability. In both quantitative and qualitative research, validity refers to data quality checking, findings and interpretation as well as to how much a measure reflects the real world with the most well-established types to be content and construct validity (Dellinger & Leech, 2007; Onwuegbuzie & Johnson, 2006; Tashakkori & Teddlie, 2010; Teddlie & Tashakkori, 2009).

Regarding quantitative research, validity refers to the scale scores' quality and whether one can draw meaningful conclusions from scores on specific instruments. Content validity refers to whether the scale's questions are truly representative of the relevant items; criterion-related validity checks if the scores are related to any other similar scale; construct validity examines whether scales measure what they need to measure; internal validity refers to the potential conclusions drawn from the researcher and if the findings are a result of factors examined and not from confounding variables; external validity is about the application of the findings to larger populations; and ecological validity (also used in qualitative research) refers to the possibility of generalising the research findings to real life (Creswell & Plano Clark, 2011). In this

research, efforts were made to ascertain these types of validity in each study through the research methods and standardised measures selected, analysis conducted and interpretation of findings.

Regarding qualitative research, validity refers to the accuracy of the findings through the use of certain procedures by the researcher (Creswell, 2009). However not all of the aforementioned quantitative methods of quality control can be applied to qualitative data as they imply a positivist stance; thus other quality methods are required (Creswell, 2007; Creswell & Miller, 2000; Silverman, 2013). For example, in quantitative research, generalisability can be ensured through large sample sizes as the sample is seen as adequately representative of the population. Regarding qualitative research, generalisability has been criticised because of usually inadequate sample sizes, lack of statistical generalisability and focusing on the details of a phenomenon; but it can be achieved through contribution to knowledge (Goodman, 2008; Johnson, 1997; Sandelowski, 2004; Schofield, 2002; Stephens, 1982).

Another issue in qualitative research is the quality and level of interpretation of findings. Sandelowski and Barroso (2003) review of published health studies about data production and presentation classified data transformation in five groups: no or little findings' interpretation, topical surveys (interpretation based on interviews), thematic surveys (description of themes), conceptual/thematic descriptions (data or theory-driven concepts) and interpretative explanations (highest level of data transformation and interpretation into grounded theories and explanations of phenomena). In this research, efforts have been made to ensure that as much as possible high levels of interpretation of qualitative data have been met by the analysis and evidence provided in the relevant chapters, and discussion of findings is in line with the limited ancient and modern stressors research.

Reliability refers to the extent that the same results can be generated when different researchers employ the same measures to a different population group through which generalisation of findings is possible and researcher's bias is limited (Braun & Clarke, 2013). Quantitative reliability refers to whether items' scores on a scale are internally consistent and stable over time through reliability coefficients and test-retest correlations (Silverman, 2013).

Regarding qualitative research, reliability checks if the method employed is consistent with several researchers and concepts, although it is not an appropriate qualitative criterion. There are four ways to demonstrate rigour and persuasiveness of qualitative work and avoid bias: member checking, inter-coder agreement (inter-rater reliability), triangulation and universal criteria (Lincoln & Guba, 1985). Inter-coder agreement engages coding comparison among several researchers (Smith & McGannon, 2017). Triangulation encourages the use of two or more methods to examine the same phenomenon (Denzin, 1970; Smith & McGannon, 2017; Yardley, 2008). Tracy (2010) listed the universal criteria: worthy topic, rich rigour, sincerity, credibility, resonance, significant contribution, ethics, meaningful coherence. Inter-coder agreement, with at least 80% agreement among the coders as such derived from reliability statistics (kappa), has been a widely-used technique which was employed in this research so that different researchers independently do cross-check coding. Triangulation also enabled the use of two methods to gather data about the same phenomenon (Creswell, 2007, 2009; Miles & Huberman, 1994; Smith & McGannon, 2017).

All the methods face some challenges regarding quality control, epistemological issues, robustness and effectiveness, ethical and practical issues (e.g., duration), subjectivity, confidentiality and interpretation, consistency, reproductivity and replicability, expertise, criticality, and even socio-cultural and educational issues (Smith

& McGannon, 2017). The present research attempted to overcome some of these challenges through the application of the universal criteria. This research was an innovative worthy topic providing "educative authenticity" and "critical intelligence" and employed a pragmatic approach; used abundant, appropriate and sufficient data, samples and analyses; considered biases, transparency and ethical considerations; discussed the trustworthiness and plausibility of methods and findings; attempted to make the findings transferable and generalisable to contribute to wider knowledge; and achieved its general purpose regarding the literature, research questions, methods and interpretations of findings (Tracy, 2010, p. 840).

It has been recently discussed that the quality rather than the quantity of criteria plays a crucial role in mixed-methods research as well as the appropriate use of those in each method; quantitative criteria for quantitative approaches, and qualitative criteria for qualitative methods (Bishop, 2015). Other researchers have created quality criteria that can be used in both approaches ensuring the research is rigorous (in methods, data collection and analysis), transparent and coherent (fitting the data and arguments between the theory and methods), sensitive to context (considering literature, previous studies and ethical issues), and has practical implications that enrich theory (Yardley, 2000, 2008). In order to provide a plausible and defensible rationale, this research considered these quality criteria through a clear and detailed discussion and justification of the methods and analyses used.

3.6 Sampling, recruitment and participants

In order for a research question to be answered, sampling procedures should be considered such as the location of the study, recruitment and number of participants (Morse & Field, 2002). Regarding quantitative sampling, this research used a non-

probabilistic technique (i.e. snowball sampling), where selection of participants is very specific based on their availability and inclusion criteria, to examine the topics of interest and disseminate the findings (Sandelowski, 2000; Teddlie & Yu, 2007). Regarding qualitative sampling, this research employed a purposeful/purposive approach (intentional selection and recruitment of participants who have been engaged in a specific concept or phenomenon) to examine participants who had participated in the quantitative phases of studies one and two in order to gain "insight and in-depth understanding" of ancient and modern stressors and the other topics of interest (Patton, 2002, p. 230). However in mixed-methods research, there are not specific typologies for data collection and sampling procedures. This research did not target specific populations but instead randomly recruited volunteers who met the inclusion criteria and consented to participate.

3.7 The use of mixed methods in the present research programme

3.7.1 Rationale for the use of mixed methods

As discussed above, there is a variety of different reasons to use mixed methods: the need to explain and generalise exploratory results, to strengthen a study using a second method because one data source is not adequate, and to answer a research question via multiple research stages (Bryman, 2006; Creswell & Plano Clark, 2011; Greene et al., 1989).

Regarding the present research, mixed methods were used to assess the feasibility of distinguishing between ancient and modern stressors. Multiple phases were required so that findings could guide the design and interpretation of next studies. Regarding the first research question (study one; part one), a quantitative method (i.e. questionnaires) was employed and followed from a qualitative method (i.e. interviews).

However, this analysis did not provide sufficient evidence and a plausible justification to distinguish between ancient and modern stressors. For this reason and regarding the second research question (study one; part two), a qualitative CA approach was used to explore specific ancient and modern stressors from Schreier and Evans (2003). The quantitative analysis was re-conducted with these life event stressors and the different qualitative analysis was employed to identify psychological characteristics. This analysis enabled the mixing of quantitative and qualitative data in order to i) discuss and interpret the findings, ii) gain a better understanding of ancient and modern stressors, and iii) inform the design of study two.

In relation to the third research question (study two), a mixed-methods approach was employed; quantitative data were first collected followed from qualitative data collection and analysis. In this qualitative phase, interviews were formed based on the characteristics that were found in study one. Both quantitative and qualitative analyses were conducted in the specific ancient and modern stressors that had been used in the second part of study one. This approach enabled not only the discussion and interpretation of quantitative and qualitative findings together with regard to ancient and modern stressors, but also the confirmation of psychological characteristics. Thus, studies one and two could provide a provisional distinction between ancient and modern stressors, informing study three's design and examining the fourth research question. Lastly, the findings of all three studies were mixed in order to provide an overall discussion (in chapter eight) of the general purpose of this research programme.

3.7.2 The mixed methods typology and analytic strategy used in the present research

This research programme has used a pragmatic mixed-methods approach and has focused on the most appropriate methods to answer the research questions. The first two studies of this research programme have used an explanatory (cross-sectional) design and study three a quantitative (computer-based) design (Creswell & Plano Clark, 2011). A multiphase design was required so that each study followed from the findings of previous studies (Figure 3.1). Quantitative data of all three studies were analysed statistically, and followed from qualitative analysis using TA (only in study one) and CA (in studies one and two). In studies one and two, data were synthesised through aggregation, which is a logic of synthesis whereby quantitative and qualitative findings are integrated through mixed methods to present evidence, provide a holistic interpretation and discuss a phenomenon (Sandelowski et al., 2006; Sandelowski et al., 2012).

3.8 Ethical considerations

The British Psychological Society (BPS) (2009, 2014) outlines the ethical considerations of research as: consent, deception, debriefing, withdrawal, confidentiality, anonymity, and participants' protection. In all three studies, participants were given detailed information about the study through a participant information sheet and verbally from the researcher before obtaining consent via a consent form for each phase. Participants were informed that they were free to withdraw participation at any point and could also request to withdraw their details and data from the database at any point prior the data having been aggregated in analysis and publication, with no form of penalty or consequences incurred and without the need to furnish any reasons. Although

none of the studies employed any deception through the presentation of misinformation to subjects, a debrief sheet was necessary as some information was withheld from participants so as not to bias the results; for example, the detail about the ancient and modern stressors distinction in all three studies and which the SCEs are in studies one and two.

Participants were assured that their data would be kept confidential and anonymised. Confidentiality and anonymity were ensured by giving each participant an assigned ID serial number (1-100) rather than including their names with the original data; no original list of participants was held by the researcher. Participants also consented to be contacted via email for phase two (i.e. interviews) if selected, and for the interviews to be audio-taped. Any contact email address was stored separately from the data collected and ID information; only the researcher had the master code linking contact and ID information which were stored electronically via a password-protected system, and all data are kept in the 10 West data storage facility for at least three years. Audio recordings were securely stored in the same way and deleted following transcription.

The research did not involve any significant disadvantages and obvious risks beyond those normally encountered by the participants in their usual day-to-day life. It was not thought that participants were subject to increased risk of physical/psychological harm through participation, although talking about sensitive issues and stressful life events might have caused them mild distress or upset depending on the meaning of those events. Across the studies, no participant became distressed during the questionnaire or interview. Participants had been informed that they would discuss life events that had been rated as stressful by themselves in their own questionnaires, and that they were free not to answer to any question that might have

made them feel distressed as well as to stop the interview if they were not able to provide any information. The studies did not induce any form of stress but rather required participants to report their own perceptions and experiences of naturally occurring stress.

Additionally, participants were advised not to put pressure on themselves in order to recall past experiences and coping strategies with life event stressors. They were also informed that the SCEs that they reported in the interviews did not constitute a personal characteristic of themselves and they were not judged as for example a guilty or ashamed person. Lastly, participants in study two were informed that there is no causal relationship between the life events stressors examined in the present research and cold symptoms.

The studies were carried out in locations in which the respondent was comfortable (i.e. Department of Psychology laboratories), thus minimising the risks to their safety. If any of the questionnaires or interview were to trigger an emotional response that participants were concerned about although this was unlikely to have occurred, they would be advised to contact either their GP, or the University of Bath student support services or the Samaritans; details of the latter two were provided on the information, consent and debrief sheets. Additionally, ethical issues should be considered for the researcher, who had to delve deeply in the context in order to explore and analyse the underlying meaning of interview transcripts. Some of participants' discussions might have brought memories or similar past experiences to the researcher; for this reason, the evaluation of context was discussed in supervision meetings.

Although payment of participants has been criticised (BPS, 2009), it can greatly aid with recruitment and retention (if the study has several phases) and enable the researcher to thank participants for their time and effort in research (Greene & Hogan,

2005). In the present research, participants were paid for their participation (studies one and three) or participated in prize draws (study two) and this did not have a coercive impact as the researcher ensured that participants were aware that the payment did not prevent them from their right to withdraw. All three studies gained ethical approval from the Department of Psychology ethics committee.

This research programme also considered and was in line with the University's ethics code in relation to integrity, openness and honesty in all aspects of research; objectivity, selflessness and accountability to protocols and University's ethics code; excellence and transparency regarding research aims, methods, and data analysis and interpretation; equality and diversity regarding participation; legality and respect to human subjects and rights. In addition, future and wider application of this research should consider some of the NHS values: compassion/kindness as this research assesses one's stressful sensitive issues; respect/dignity as the experience and appraisal of ancient and modern stressors are different and unique for each person; improvement of health, well-being and QoL through the conceptualisation of ancient and modern stressors in everyday life; and equality/diversity in order not to potentially discriminate individuals from dealing with ancient and modern stressors.

Lastly, another wider ethical issue that needs to be taken into account has to do with multi-culturalism. The present research examined life event stressors (e.g., bereavement, unemployment), which might be understood and appraised in different and several ways not only between males and females and younger and older adults, but also between individuals from different social, cultural and racial backgrounds. In order for this research to include different viewpoints and experiences, also acknowledging the barrier of language between the interviewer and the interviewees, the questions and prompts were formed in a crystal clear way to avoid any misunderstandings in the

meaning of topics of interest. The researcher was always present during the quantitative and qualitative phases in order to solve any queries. Having presented and discussed the literature and methodology that underlies this research programme, this thesis will now move and focus on the empirical studies of this programme of research.

Chapter Four: Study One (Part One)

Exploring the association between life events, hassles and self-conscious emotions in the everyday life of younger adults

4.1 Chapter overview

The first study has been divided in two parts. Part one of study one is presented in this chapter and part two will be presented in the following chapter (Chapter five). The present study explores the feasibility of designating psychosocial stressors as ancient and modern and examines the association between this stressor distinction and self-conscious emotions (SCEs). This chapter introduces the psychosocial factors (i.e. life events and daily hassles) that younger adults encountered and found stressful in their everyday life and links them with the broader stress and coping research, SCEs, and the role of gender in stress literature. This study aims to identify which psychosocial factors younger adults have found stressful and why, and whether these reasons could provide evidence to categorise stressors as ancient and modern using a series of questionnaires (phase one) and semi-structured interviews (phase two). A cross-sectional design using mixed methods was employed. Psychosocial stressors were found to be associated with SCEs, and an inductive thematic analysis revealed six higher-order themes presenting what psychosocial stressors younger adults experienced and why.

4.2 Introduction

4.2.1 Linking the present study with the broader literature of stress and emotions

As discussed in the literature review, in the transactional model of stress and coping if a stimulus is perceived as a stressful encounter the transactional alternatives are considered (e.g., harm/loss, threat, challenge) and in parallel individuals evaluate coping resources to deal with the stressor (Folkman, 1997; Lazarus & Folkman, 1984b). The cognitive process of appraisal and coping play a key role in individuals' adaptation to a stressor (Ganzel et al., 2010).

Psychosocial factors consist of negative (or positive) stressors, such as minor or major life events and daily hassles, which can lead to negative emotions and physical health outcomes (Brannon et al., 2013; Kanner et al., 1981; Lazarus & Folkman, 1984b). Life events and hassles might be independent of each other or mutually dependent, require some degree of adaptation and have been positively associated with health outcomes; however life events have a greater magnitude on stress and health outcomes than hassles (Cohen & Lazarus, 1979; Cohen & Hoberman, 1983; Cohen et al., 1997; Compas, 1987; Kershaw et al., 2014; Lazarus, 1986; Schwarzer & Schulz, 1998). Hassles have been found to be a stronger predictor of negative emotions and physical health than life events (DeLongis et al., 1982; Evans & Edgerton, 1991; Kanner et al., 1981). Inability to adapt and deal with stressors can result in prolonged stress responses, increased physiological arousal, negative emotions and negative physical outcomes (e.g., allostatic load) (Danner et al., 2001; Dickerson, 2008; Dickerson et al., 2009; Sterling & Eyer, 1988).

The stress and emotions relationship has been well-established from the 1960s until recently (Dewe, 1991; Indik, Seashore, & Slesinger, 1964; Kershaw et al., 2014; Schachter & Singer, 1962). According to the appraisal theory of emotions, psychosocial

stressors can also be experienced as negative (or positive) emotion outcomes (e.g., SCEs) through meaning-based coping processes (Folkman, 1997; Glanz et al., 1990; Lazarus, 1991; Reeve, 2009; Siemer et al., 2007; Smith & Kirby, 2009; Smith & Lazarus, 1990; Tangney & Dearing, 2003). Emotions are experienced when one perceives a stressor and determines whether the outcome relies upon their own appraisal (Robins & Schriber, 2009). SCEs have been examined in relation to anxiety (Muris et al., 2015), PTSD (Feiring et al., 2002), chronic pain (Turner-Cobb et al., 2015), and QoL (MacAulay & Cohen, 2014; Rüsch et al., 2007).

A range of acute psychosocial stressors (e.g., breaking up an intimate relationship) can be associated with the SCEs of shame and guilt, if the life events have been appraised as important to one's actions, behaviour and self-evaluation (Bulger, 2013; Reisenzein & Hofmann, 1990; Roseman, 1991; Roseman et al., 1990; Siemer et al., 2007; Weiner et al., 1982). Acute social-evaluative or laboratory tasks (e.g., talking in front of an audience) can result in greater SCE experiences, higher HPA axis activation and cortisol release (Dickerson, 2008; Dickerson & Kemeny, 2004; Gruenewald et al., 2007; Kirschbaum et al., 1993; Lewis & Ramsay, 2002; Miller et al., 2007). Additionally, shame, guilt and blame can lead to physiological alteration, such as increased cortisol and HPA axis activation (Dickerson, Gruenewald, et al., 2004; Dickerson, Kemeny, et al., 2004; Dickerson et al., 2008). Study one aims to identify which life event and hassle stressors younger adults experienced in everyday life and the reasons why, and to investigate associations between psychosocial stressors and SCEs.

4.2.1.1 Total number and severity of psychosocial stressors

The total number and severity of life events and hassles have been considered in empirical stress research and the design of stress scales (e.g., Social Readjustment Rating Scale) (Rahe, Mahan Jr, & Arthur, 1970; Roca et al., 2013). The severity score reflects better the impact of psychosocial stressors on individuals' health and distress compared to the total number (Holmes & Rahe, 1967), such as the impact of life events upon happiness (Ballas & Dorling, 2007).

The total number of life events and hassles has been associated with increased risk of psychotic disorders in adolescents (Tessner, Mittal, & Walker, 2009), onset of mental disorder symptoms (Brown & Birley, 1968; Day et al., 1987), physical activity in young adults (Uijtdewilligen et al., 2014), chronic headache in university students (Bottos & Dewey, 2004), depression, psychosomatic symptoms and negative well-being (Holahan & Holahan, 1987), SES and aggression in children (Attar, Guerra, & Tolan, 1994), and breast cancer (Lillberg et al., 2003). The severity of psychosocial stressors events has been associated with anxiety (Kacel, Morgan, & Pereira, 2014), depression (Kendler, Thornton, & Gardner, 2001), cognitive performance in memory tasks (Desmond, Cummins, Ames, Dennerstein, & Szoeke, 2013), and headache frequency and intensity (Fernandez & Sheffield, 1996). However, other studies showed that the number of life events was unrelated to health (e.g., cardiovascular diseases) and inversely related to mortality and morbidity (Hollis, Connett, Stevens, Greenlick, & Group, 1990). These evidence-based studies provide a rationale for the present study to assess life events and hassles in terms of the total number and severity.

4.2.2 The role of gender in stress, coping and emotions research

In addition to the impact of SCEs, gender plays an important role in the relationship between stress, coping and emotions. Research suggests that women experience and deal with more life event stressors during lifetime appraising them as more stressful than men (Davis, Matthews, & Twamley, 1999; Matud, 2004; Mayor, 2015). Gender differences have been assessed and found in several different age populations, such as children, adolescents (Burke & Weir, 1978) and adults (Hara et al., 2014), regarding appraisal of physio-psychological stress, emotions, coping and health (Folkman, Lazarus, Gruen, et al., 1986).

Marco (2004) claimed that women are more likely to use emotion-focused coping strategies (Folkman & Lazarus, 1980; Hamilton & Fagot, 1988) than men who use problem-focused coping (Pearlin & Schooler, 1978; Stone & Neale, 1984). Problem-focused coping has been found to be more adaptive to stressors than emotion-focused (Billings & Moos, 1981; Menaghan, 1982). However, this argument is problematic because some coping strategies are more adaptive than others for both genders (Abraham & Hansson, 1996; Feldman, Fisher, Ransom, & Dimiceli, 1995; Hovanitz & Kozora, 1989). This adaptation of coping relies upon the controllability of the stressor and gender differences in coping could be inherent, learnt, socially or biologically-driven. For example, men are likely to use problem-focused coping (e.g., avoidance and withdrawal) with uncontrollable stressors because of gender socialization (i.e. personal control is central to male role) or biological foundations, i.e. fight-flight response (Tamres, Janicki, & Helgeson, 2002).

A meta-analysis by Tamres et al. (2002) suggests that if there are gender differences in coping (and not only individual differences in coping): firstly, women, compared to men, make greater and more frequent use of problem and emotion-focused

coping strategies (Thoits, 1991, 1994, 1995). Secondly, women are more likely to seek emotional social support, to ruminate and engage in positive self-talk across a range of stressors rather than men; effect sizes were small ($r \approx -.15$), but significant ($p < .001$) and homogenous across studies. Thirdly, there might be other variables (e.g., age) that influence gender differences in coping; for this reason, the present study will assess gender differences in coping with younger adults and the next study with older adults. Fourthly, women are likely to appraise a stressor as more severe than men. Fifthly, although there is no strong recent empirical evidence, men appear to use problem-focused (active coping) and avoidant coping but there is no coping approach that men are more involved in than women. Sixthly, the nature of stressors affects coping; women are likely to cope more effectively with personal and others' health issues than men. This meta-analysis found evidence that there are some consistent but also inconsistent and ambiguous findings across previous studies and did not confirm some of the oldest beliefs and research about gender differences in coping.

Gender differences have also been found between psychosocial stressors and emotions (Ellsworth & Scherer, 2003; Moksnes, Moljord, Espnes, & Byrne, 2010). Previous studies have shown that girls are keener to express emotions than boys (Malatesta et al., 1989). There are also studies which have looked at gender differences in SCEs; girls are more likely to experience guilt when dealing with stressful situations than boys, and women are likely to report greater shame and guilt than men (Kushnir, Godinho, Hodgins, Hendershot, & Cunningham, 2016; Lewis, 1995). Regarding gender differences in the appraisal and coping with stressful shame-related situations, men deal more efficiently with these situations than women (Efthim et al., 2001; Lewis & Ramsay, 2002; Pivetti et al., 2016). A meta-analysis found small gender differences in shame and guilt that were significant only for White populations, although qualitative literature reviews of trait SCEs showed that women are more likely to experience higher

levels of trait shame and guilt rather than men (Else-Quest et al., 2012). There is a great body of research on gender differences in coping with psychosocial stressors and mixed-evidence research in SCEs. One of the main objectives of study one is to explore younger adults' gender differences in coping with life events and SCE experiences in relation to ancient and modern stressors.

4.2.3 Aims of study

The aim of the first part of study one is to identify which psychosocial stressors younger adults encountered in everyday life and the reasons why in order to designate these stressors as ancient and modern regarding adaptation and coping. To investigate this aim, what stressful life events and hassles have been experienced by younger adults are identified through questionnaires (phase one). This quantitative phase is required to inform and conduct the interviews (phase two), which have been analysed through inductive TA. The aim of the qualitative phase is to explore whether these reasons can provide evidence to designate life event and hassle stressors as ancient and modern stressors.

Thus, the objective of the present study for the quantitative phase is:

- to identify associations between psychosocial stressors and SCEs through correlations.

For the qualitative phase, the objectives are:

- to identify a range of different responses as to how younger adults were thinking and feeling about psychosocial stressors;
- to investigate the reasons why psychosocial factors were appraised as stressful by younger adults;

- to explore whether these reasons could provide evidence to designate stressors as ancient and modern stressors in relation to adaptation and coping;
- to examine if SCE experiences and coping strategies differ between men and women regarding ancient and modern stressors.

4.2.4 Hypotheses of quantitative phase of study

In order to examine associations between life events and daily hassles with SCEs in younger adults, the hypotheses are as follows:

1. Psychosocial stress will be associated with SCEs.

2. The total number of life events will be positively associated with more negative SCEs than the total number of hassles.

3. The severity of life events will be positively associated with more negative SCEs than the severity of hassles.

4. Gender will be associated with SCEs.

4a. Men will report greater detachment and externalisation and women will report greater shame and guilt in psychosocial stressors.

4.3 Method

4.3.1 Design

A cross-sectional design using a mixed-methods approach was selected for study one, which assessed psychosocial factors (i.e. life events, daily hassles) (Independent

Variable) and SCEs (Dependent Variable) of a representative subset of the population over a short period of time. The diagram below illustrates the design and implementation of the present study (Figure 4.1).

Study one incorporated quantitative and qualitative research methods to gather and analyse the data. In phase one, a series of self-report psychological questionnaires were used to measure a range of stressors including life events, hassles, perceived stress (a more generalised subjective measure of stress) and SCEs (Brannon et al., 2013; Dietrich, Abbott, Gartner-Schmidt, & Rosen, 2008). Questionnaires were used to identify which psychological factors younger adults found stressful and to test the hypotheses.

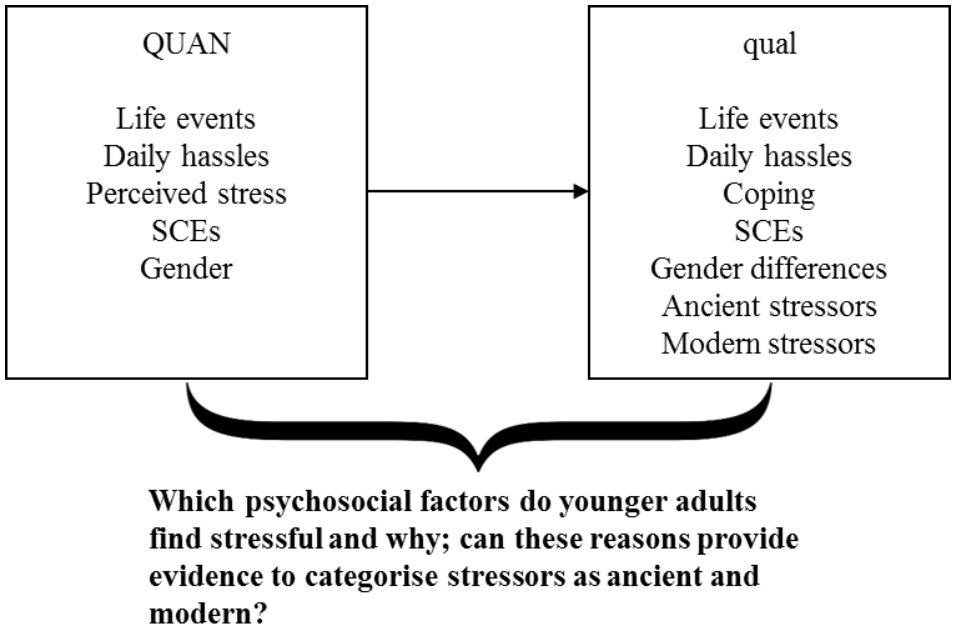

Figure 4.1. Diagram of the sequential mixed-methods approach employed in study one.

In phase two, semi-structured interviews were conducted to ask participants specific questions referring to their questionnaire responses regarding psychosocial factors, SCEs, adaptation and coping (al'Absi, 2011; Brown & Harris, 1989; Brugha,

Bebbington, Tennant, & Hurry, 1985; Fallon, 2008; Whiting, 2008). Participants were selected based on the total number of stressful items experienced (i.e. sum through descriptive statistics) and were drawn from the highest and lowest quartile of the sample in order to examine a range of different responses regarding life event and hassle stressors; semi-structured interviews explored, informed and explained the questionnaires data (Guest, MacQueen, et al., 2012). Semi-structured interviews were used to explore younger adults' adaptation and coping with stressors in order to designate them as ancient and modern; and gender differences in coping and SCEs experience.

4.3.2 Participants and recruitment

One hundred younger adults (60 females) were recruited across the University of Bath to participate in the first phase of the study (i.e. completion of questionnaires). Socio-demographic details were completed and reported in table 4.1. The majority of the participants were white/Caucasian and single pursuing a bachelor's degree. Based on a power analysis with an estimated medium effect size of 0.15, power of 0.80 and alpha of 0.05, a sample size of 76-84 participants was required to enable meaningful quantitative analyses (Cohen, 1992).

All respondents consented to participate in the study. The participation response rate was 83%; 120 younger adults were invited to participate and 100 consented to take part. The in-person invitation was the most successful recruitment method attracting the majority of the participants (n = 90; 90% of the sample). Other recruitment methods involved the Department Research Participation Scheme (n = 7) and flyer advertisements (n = 3).

Table 4.1

Participant socio-demographic information (N = 98)

		Mean	*Standard Deviation (SD)*	Range
Age (in years)		20.33	1.74	18-24
			n	%
Ethnicity	White/Caucasian		78	80
	Asian/Pacific		16	16
	Hispanic/Latino		1	1
	Black/African/Caribbean		1	1
	Mixed		2	2
Marital status	Single		67	68
	In a relationship		30	31
	Engaged		1	1
Academic status	Undergraduate students		83	85
	Postgraduate students		15	15

Following the analysis of the questionnaire data, 20% of the initial cohort (n = 20 participants) was selected and re-contacted to participate in the interviews (phase two); a total of 20 younger adults (11 females) consented and participated. The majority of the participants were white/Caucasian, single and undergraduate students. The interviews ranged in length from 30 to 80 minutes (M = 43.00 minutes, SD = 13.32) (Table 4.2). A pilot study with five volunteers was initially conducted to assess the interview duration; each interview did not last less than 30 minutes (these data were not included in the overall sample for analysis). Although the guidelines usually suggest about one hour time length (Rubin & Rubin, 2011), based on the interview protocol developed and the aims of the qualitative phase, at least thirty-minute interviews were considered sufficient for participants to discuss in-depth the topics of interest.

Table 4.2

Socio-demographic characteristics of interviewed participants (n = 20)

	Mean	*SD*	Range
Age (in years)	21.20	2.04	18-24
Total number of stressful items	15.56	10.20	4-42

		Lowest quartile	Highest quartile
		n	*n*
Ethnicity	White/Caucasian	8	9
	Asian/Pacific	2	1
Marital status	Single	7	8
	In a relationship	3	2
Academic status	Undergraduate students	10	3
	Postgraduate students	0	7

4.3.3 Measures

In study one, all participants were provided with an identical set of a series of self-report questionnaires, made up of four components (i.e. life events, daily hassles, perceived stress, SCEs). These standardised questionnaires were selected in this study because they have been widely used in research and have high reliability and validity. Participants also provided some demographic information.

4.3.3.1 Psychological measures

4.3.3.1.1 Life Events Inventory (LEI)

Life events were assessed using the LEI; a 67-item self-report scale, which describes a list of life events and measures the life change or the level of emotional distress a life event caused (Holmes & Rahe, 1967; Paykel, Prusoff, & Uhlenhuth, 1971; Tennant & Andrews, 1976). This scale involves a wide range of desirable or undesirable life events experienced by individuals in everyday life, which can be considered as stressful and negative. Tennant and Andrews (1976) and Rabkin and Struening (1976) argued that an increased frequency of life events can lead to higher accumulated lifetime stress, physical and psychological illness. The modified 62-item inventory was used to measure the degree of distress caused by a life event during the last year. All items were rated on an 8-point Likert scale; 0 (*not happened*), and from 1 (*not at all stressful*), 4 (*moderately stressful*), to 7 (*extremely stressful*) if the life event had happened. For this study, the modified scale indicated a high level of internal consistency with the specific sample (Cronbach's $\alpha = .93$). Participants were asked to read each statement and circle how stressful it was for them. Space was provided at the end of the questionnaire for participants to include any additional life events not listed that had occurred in the last year. Consistency of items was assessed using Spearman's rank order correlations; $r_s = 0.98$ (Tennant & Andrews, 1976). Some scale items were amended and adjusted to fit the needs of the study and the sample age. For example, the word 'work' was amended to 'University'; 'wife/husband/fiancé' to 'partner'; 'brother' to 'sibling'; 'marital' to 'relationship'; 'retired' to 'graduated'; 'Sydney/Australia' to 'Bath/Europe' (see Appendix A).

4.3.3.1.2 Hassles Scale

Daily hassles were assessed using the Hassles and Uplifts Scale, a revised 53-item version (DeLongis et al., 1988), which is used to rate which of the listed items are considered as hassles and/or uplifts during the course of a day (Kanner et al., 1981). It has been found that hassles constitute a better predictor of psychological issues than major life events, and that there is a significant relationship between stress caused by daily hassles and the onset of physical health symptoms (e.g., flu, headaches and back pain) (DeLongis et al., 1982; DeLongis et al., 1988; Ivancevich, 1986; Lazarus & Folkman, 1984b; Weinberger, Hiner, & Tierney, 1987). The modified hassles scale assessed how much of a hassle was each daily event in the past month. Fifty-three items were scored on a 4-point Likert scale: 0 (*none/not applicable*), 1 (*somewhat*), 2 (*quite a bit*), 3 (*a great deal*); total hassles scores were obtained by summing the ratings given to the items. For this study, the modified scale indicated a high level of internal consistency with the specific sample (Cronbach's $\alpha = .86$). Participants were asked to think how much of a hassle each item was for them and to circle their response in each item. Space was provided at the end of the questionnaire for participants to include any additional daily hassles not listed that had occurred in the last month. Graf, Ramsey, Patrick, and Gentzler (2016) found for this scale a Cronbach's $\alpha = .77$; high test-retest reliability for hassles frequency ($r = .79$) and intensity ($r = .48$) (DeLongis et al., 1982; Kanner et al., 1981). Some scale items were amended and adjusted to fit the needs of the study and the sample age. For example, the word 'children' was amended to 'parents'; 'spouse' to 'partner'; 'clients/customers/patients' to 'University staff'; 'yardwork' to 'assignments/coursework'; 'car maintenance' to 'course presentations' (see Appendix A).

4.3.3.1.3 Perceived Stress Scale (PSS-10)

Perceived stress was assessed using the PSS-10, which measures "the degree to which situations in one's life are appraised as stressful" and assesses the level of perceived stress an individual experienced in the past month from situations which could be regarded as "unpredictable, uncontrollable, and overloading" (Cohen et al., 1983, pp. 385, 387; Cohen & Williamson, 1988). The 10-item version was scored on a 5-point Likert scale: 0 (*never*), 1 (*almost never*), 2 (*sometimes*), 3 (*fairly often*), 4 (*very often*). The positive items four, five, seven and eight were scored in the reverse direction; "0 = 4" and "1 = 3". Before statistical analyses, scores of PSS-10 were reversed so that high scores indicate high levels of scale, thus ensuring statistical and conceptual clarity. Scores can range from zero to 40 and higher scores show more perceived stress. Participants were asked about their feelings or thoughts during the last month and to circle their response in each case which represented how often they felt or thought in a certain way. This scale, compared to the original 14-item version, provides a stronger factor structure, better internal reliability (Cronbach's $\alpha = .78$), greater validity, tighter prediction of physical symptoms, and it is positively correlated with a number of self-reports and measures of stress in adults (Cohen & Williamson, 1988) (see Appendix A).

4.3.3.1.4 Test Of Self-Conscious Affect (TOSCA-3)

SCEs were assessed using the TOSCA-3 (Tangney & Dearing, 2003, pp. 207-214) composed of 11 negative and five positive scenarios (i.e. scenarios number three, six, eight, 11, 14) assessing shame-proneness, guilt-proneness, externalisation (blame), detachment (unconcern), pride (beta pride) and hubris (alpha pride). Participants were asked to imagine themselves in each scenario, i.e. situations that people are likely to

encounter in day-to-day life (e.g., "You make plans to meet a friend for lunch. At 5 o'clock, you realise you stood your friend up.") and to indicate how likely they would be to react in each one of the ways described (e.g., "You would think: 'I'm inconsiderate'" = shame, "You would think: 'Well, my friend will understand'" = detachment, "You'd think you should make it up to your friend as soon as possible" = guilt, "You would think: 'My boss distracted me just before lunch'" = externalisation); from 1 (*not likely*) to 5 (*very likely*) in a 5-point Likert scale (Tangney & Dearing, 2003, p. 207). Cronbach's α for each of the scales were ≥ .70. Scale scores are the sum of the rated responses to relevant items (e.g., the score for the shame scale is calculated from the participant's answer to 1a, plus 2b, etc.) (see Appendix A).

4.3.3.2 Qualitative materials

4.3.3.2.1 Semi-structured interviews

The in-depth interviews were semi-structured and used an interview protocol which followed on from the topics covered in the questionnaires. The style of interviews was an informal conversation and the questions were phrased in a clear and non-threatening way. The researcher listened carefully and checked participant's understandings and interpretations of the questions. Semi-structured interviews is one of the most widely used method of data collection within qualitative research in Psychology because interview data are compatible with several methods of data analysis, allow the conversation to flow naturally, and keep open and closed questions focused around the topics of interest (see chapter three) (Irwin & Johnson, 2005; Willig, 2013).

4.3.3.2.2 Interview protocol

Although several interview protocols have been used to examine psychosocial stressors in adults' everyday life, a new interview protocol specifically about stress and SCEs was developed. The rationale behind the need for developing a new protocol was because of the lack of an interview protocol which examines the relationship between psychosocial ancient and modern life event stressors, SCEs and coping mechanisms; taking also into consideration the appraisal of and notion of adaptation to stress. The interview protocol for this study was designed according to the qualitative interviewing literature and guidelines by Murray and Chamberlain (1999). Participants' responses in questionnaires (phase one) about stressful negative life events, daily hassles and SCEs were used to guide the interview protocol.

The interview protocol used for study one comprised eight questions, which were divided into two main sections. Before the main sections, the researcher explained the procedure of the interview, reminded participants of their rights during the interview, and some warm-up questions followed. Section one had six questions in order to gain a clear understanding of what kind of life events and hassles could have been considered as stressful and why, as well as what the emotions were that these stressors had triggered.

Section two included two key questions about how participants adapted and dealt with stressors ("Could you adjust yourself (adapt) to this life event/hassle?" and "How did you deal with this life event/hassle?"). The answers on these questions would provide some form of indication in order to designate a stressor as ancient or modern regarding adaptation and coping. Before the completion of the interview, the researcher asked the participants some final questions regarding the interview in order to receive some feedback. After the interviews there was usually a discussion of how the

participants felt about the interview, their potential interest in the research area and its applications (equivalent to debriefing). The list of interview questions can be found in appendix B.

4.3.4 Procedure

Participants were given an information sheet to read prior to taking part in the study during the recruitment process. They were offered the opportunity to ask questions after reading the information sheet. If they were interested in taking part in the study, a laboratory appointment was booked with the researcher; any weekday and time convenient for the participant. Participants were individually required to attend a 30-minute laboratory appointment for paper questionnaire completion (phase one).

At the appointment, participants were welcomed into the Stress Laboratory, were given the information sheet to read again and the study requirements were explained. They were given the opportunity to ask any questions about the procedure and the purpose of the study. Consent was obtained using a written consent form at the laboratory appointment before any data collection; one for phase one (completion of questionnaires) and another one for phase two (interview) if selected. The consent form was signed (one copy for the participant and one for the researcher) and they proceeded to complete the questionnaires. After the completion of the questionnaire, participants were informed that they would be re-contacted to take part in the interview phase in the next four weeks, if selected.

Participants were required to attend approximately a 45-minute to an hour appointment for the interview (phase two). One-on-one semi-structured interviews were audio-recorded to ensure the validity of the study. A voice recorder (ZOOM H1 Portable Digital Recorder, Zoom manufacturer) was used. An information sheet about

the interview was given to the participant and the study was explained verbally. Participants were asked to provide further information about their experiences, thoughts and feelings about stressful negative life events and daily hassles, coping and SCEs based on their answers in the questionnaires. After completion of both phases, participants were thanked, debriefed and reassured about data confidentiality (see chapter three). All participants' data was valid and complete for computation and analysis of results.

4.3.5 Ethical considerations

The present study was granted full ethical approval from the ethics committee at Departmental level as required by the University and was in line with the BPS ethical guidelines (2009) on 11th February 2015 (ethics reference number: 15-006) (see chapter three). Participants aged under 18 and over 24 years were excluded and those suffering from any stress-related condition as far as they were aware. Each interview was assigned by the participant's ID number and identifying names and places were removed during transcribing to ensure anonymity.

4.3.6 Analytical plan

4.3.6.1 Statistical analysis

Concerning the first phase of the study, inferential statistics using Pearson's *r* correlations were conducted to analyse the quantitative data of questionnaires in IBM SPSS Statistics software version 22. These were conducted to examine associations between life events, hassles, perceived stress, gender and SCEs. The correlations were also used to check for potential multicollinearity and singularity issues among the

variables (Tabachnick & Fidell, 2007). This quantitative work was important to identify significant associations between psychological variables and SCEs, to structure the interview protocol and conduct the interviews. The IVs were the total number and mean severity (i.e. total severity of life events divided by total number of life events) of life events, total number and mean severity of hassles, perceived stress and gender. The DVs were shame, guilt, detachment, externalisation, alpha pride, beta pride, and overall negative SCEs.

4.3.6.2 Thematic analysis

Regarding the qualitative phase of the study, verbatim transcription using MS-Word software and hand-written notes and analysis of the content of interviews using thematic analysis (TA) were employed. TA is one of the most flexible analytic approaches which identifies, describes and interprets both implicit and explicit key themes drawn from the data. Section 3.4.2.1 (in chapter three) has outlined the six stages of TA. In order to designate psychosocial stressors as ancient and modern, an inductive (exploratory bottom-up) data and researcher-driven approach was employed (Braun & Clarke, 2006, 2013; Guest, MacQueen, et al., 2012; Guest, Namey, et al., 2012). The main aim of this qualitative work was to explore whether the reasons why younger adults experienced psychosocial factors as stressful could provide sufficient evidence to designate ancient and modern stressors regarding adaptation and coping.

4.4 Results

4.4.1 Data screening

Prior to inferential analysis, data screening was conducted and assumptions were tested. There were no missing values; the IVs and DVs were continuous variables, paired, and were measured at interval level; approximate normality of data was assessed using histograms (with normal distribution curves), mean skewness and kurtosis scores and the Kolmogorov-Smirnov normality test; the assumptions of linearity and homoscedasticity as well as no multicollinearity and singularity were met; outliers were identified. The data of the outliers were transformed to *z* scores. Two outliers (participants 21 and 92) were considered as extreme values in the guilt variable and deleted. All the other variables' data had *z* values within the acceptable range of ±3.29 (Dancey & Reidy, 2011; Field, 2013; Ghasemi & Zahediasl, 2012; Tabachnick & Fidell, 2007).

4.4.2 Descriptive statistics

The summary statistics, including the mean, standard deviation and range (minimum-maximum) of the variables of interest are presented in Table 4.3. The total number of hassles experienced by younger adults was greater than the total number of life events. However, a higher severity score was reported for life events than hassles. Younger adults also reported higher levels of guilt than shame as well as a high level of negative SCEs experience.

Table 4.3

Means, standard deviations (SD in brackets) and range of psychological variables and SCEs (N = 98)

Measures	*Mean*	(*SD*)	Range
Psychological variables score			
Total number Life events	15.79	(9.23)	4.00-58.95
Total severity Life events	53.16	(40.44)	13.00-270.00
Mean severity Life events	3.28	(.82)	1.50-5.30
Total number Hassles	26.10	(7.58)	7.00-46.00
Total severity Hassles	42.06	(16.22)	8.00-94.00
Mean severity Hassles	1.58	(.31)	1.04-2.65
Perceived stress	18.80	(6.08)	3.00-32.00
SCEs score			
Shame	2.78	(.60)	1.19-4.38
Guilt	3.94	(.41)	2.50-4.81
Detachment	2.76	(.50)	1.64-4.00
Externalisation	2.15	(.47)	1.06-3.50
Alpha pride	3.89	(.62)	2.20-5.00
Beta pride	3.99	(.59)	2.40-5.00
Negative SCEs	3.10	(.30)	2.26-3.69

4.4.3 Inferential statistics

4.4.3.1 Associations

Pearson's *r* correlations between the IVs are presented in Table 4.4; correlations between the psychological variables and SCEs are presented in Table 4.5. Perceived stress was positively associated with shame and externalisation; life events were negatively associated with shame and guilt, and positively with externalisation and negative SCEs; hassles were positively associated with alpha and beta pride, and negative SCEs (hypothesis 1). The total number of life events was negatively associated with shame and guilt, and the total number of hassles was positively associated with beta pride (hypothesis 2). The mean severity of life events was positively associated with externalisation and negative SCEs, and the mean severity of hassles was positively associated with alpha and beta pride, and negative SCEs (hypothesis 3). Regarding hypothesis 4, gender was associated with SCEs; men reported higher levels of detachment and externalisation and women greater shame and guilt (hypothesis 4a).

Table 4.4

Correlations between psychological variables (N = 98)

Psychological variables	1	2	3	4	5	6
1. Total number Life events	-	.190	.391***	.123	.024	-.199
2. Mean severity score Life events		-	.288**	.569***	.500***	.154
3. Total number Hassles			-	.296**	.250*	-.072
4. Mean severity score Hassles				-	.479***	.119
5. Perceived stress					-	.227*
6. Gender						-

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$; Gender, coded: 1 = Male, 2 = Female.

Table 4.5

Correlations between psychological variables and SCEs (N = 98)

Psychological variables	Shame	Guilt	Detachment	Externalisation	Alpha pride	Beta pride	Negative SCEs
Total number Life events	-.250*	-.225*	.078	.041	-.166	-.132	-.190
Mean severity score Life events	.189	.144	.126	.230*	.063	.102	.252*
Total number Hassles	.060	.080	.022	.006	.066	.292**	.081
Mean severity score Hassles	.148	.124	.119	.136	.211*	.225*	.259**
Perceived stress	.321***	.070	-.101	.220*	.027	.052	.193
Gender	.305**	.356***	-.274**	-.285**	.082	-.006	.073

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$; Gender, coded: 1 = Male, 2 = Female.

4.4.4 Qualitative thematic analysis findings

This section will present the findings of the inductive TA. Specifically, each sub-section will cover a higher-order theme presenting its lower-order themes and explaining what the psychosocial factors encountered by younger adults were and why they were stressful. Additionally, each sub-section will present any gender differences in coping with psychosocial stressors. The following section (i.e. 4.4.5) will present any gender differences in SCEs identified through the TA.

The interview data generated 260 quotes which were categorised into a total of 20 lower-order themes, and six higher-order themes: health and well-being, personal interactions and the self, career and occupation, news events, physical activity involvement, and financial and legal issues (Figure 4.2). The higher-order themes are presented with illustrative quotes that are indicative of the stressful psychosocial factors younger adults experienced. Quotes for all lower-order themes are presented in appendix C.

4.4.4.1 Health and well-being

The first theme, health and well-being, consisted of three lower-order themes: health of the self, health of others, and bereavement. Regarding participants' personal health as well as the health of significant others (e.g., family, relatives, friends), participants referred to key health choices and consequences such as illness, medication, smoking, contraception, eating, seeking knowledge from experts and making choices on medical issues. Regarding bereavement, participants mentioned that this event was in some cases unexpected, sudden, traumatic and very stressful.

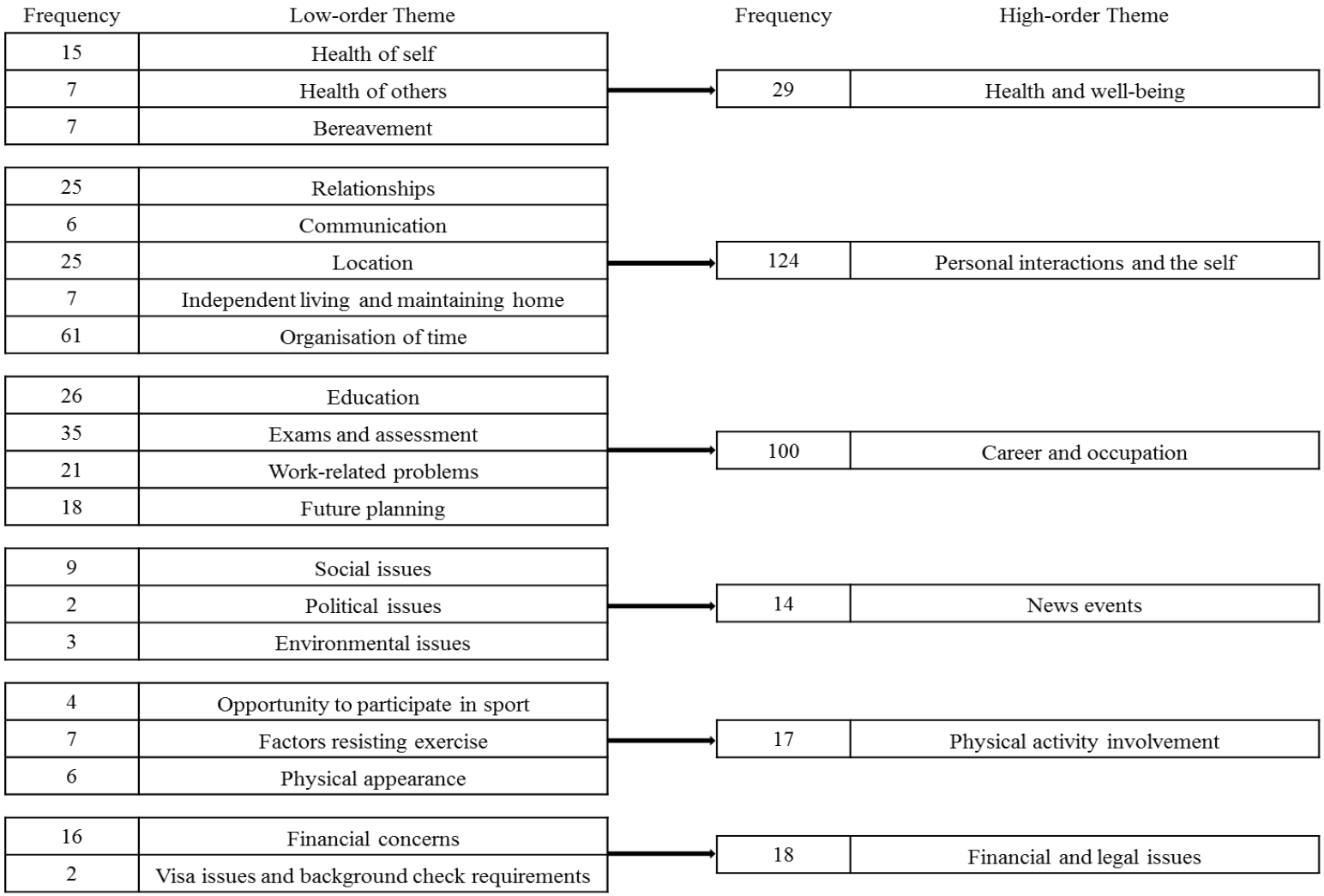

Figure 4.2. A taxonomic categorisation of negative life events and daily hassles experienced by younger adults.

In terms of health and well-being issues of others, male participants in the present study used both problem and emotion-focused coping: active coping, restraint coping, turning to religion, seeking emotional support, denial of the stressful situation and self-blame. Females employed instrumental and emotional social support, active coping, mental disengagement/self-distraction, restraint coping of passively acting, acceptance of the stressful situation, and focusing on and venting of emotions. The following quote indicates how illness influenced personal health:

> "I just had a really bad viral infection and stopped me by doing a lot of things because I do a lot of sport and it stopped me from doing that and then it's stopped me going to work and then it stopped me taking exams and it just stressed me out because you feel you are getting behind all things. I just got really upset … but that wasn't anything I could do so …. I just got quite down about it and stressed out. No I didn't adapt easy. It's kind of going worse …. No, I didn't adapt to it. I just felt worse the longer it went on." (28/Participant 2)

4.4.4.2 Personal interactions and the self

The second theme, personal interactions and the self, consisted of five lower-order themes: relationships, communication, location, independent living and maintaining home, and organisation of time. Relationships were related to intimacy, missing family and friends, establishing new friendships, colleagues, engagement in intercourse, and ending a relationship. Communication was considered as a stressor in relation to inadequate or lack of physical contact with family, friends and partner, as well as language barriers. Concerning location, participants talked about separation and distance from relatives and home country, and the moving process to a new place. Independent living and maintaining home were related to daily hassles (e.g., housework,

home repairs, cooking, dealing with paperwork and bills). Organisation of time was discussed with regard to inadequate or lack of personal organisation, time management, amount of (free) time and time pressure.

Regarding personal interactions and the self, male younger adults employed active coping, planning, suppression of competing activities (e.g., avoidance of distraction by other activities), seeking instrumental (e.g., advice, information, assistance) and emotional social support, and positive reinterpretation/reappraisal. Female younger adults dealt with these stressors also using acceptance and planning. Organisation of time is illustrated by the following quote:

> "I feel stressed about it because when you have to do something in a certain time or you have a deadline of course it makes you feel stressed. You know, I leave things at the last minute. When you realise that there is no time left and you have to do it, I keep trying to do as much as I can in the time left. And it's really stressful because you don't know if you are gonna make it. Every time that it happens to me because it has happened to me quite a lot of times, I say that this is the last time and the next time I will be organised and I will start earlier but no." (156/Participant 17)

4.4.4.3 Career and occupation

The third theme, career and occupation, consisted of four lower-order themes: education, exams and assessment, work-related problems, and future planning. Education was the most frequently experienced stressor related to studies (e.g., intellectual evaluation and competition), university life, deadlines and workload. Exams and assessment were stressful hassles in terms of inadequate performance in exams, goals and choices, and job interviews. Work-related problems were found to provoke

additional pressure to participants in relation to time pressure and the amount of workload. Regarding future planning, participants referred to unfamiliarity with job applications, their own future, future studies and career, employability and unemployment.

Concerning career and occupation, both male and female participants were found to deal with employing problem-focused coping mechanisms, i.e. active coping (e.g., direct action), planning (e.g., strategies), and seeking instrumental social support. Emotion-focused coping was also used, i.e. positive reinterpretation/reappraisal (e.g., managing distress), focusing on and venting of emotions, seeking emotional social support, and suppression of competing activities. The following quote provides an insight into education and workload:

> "Last year, in the third year of our Bachelor's degree, we had a lot of courseworks and we had a dissertation, and like four to five assignments at the same time within the exams period. And throughout the semester, usually, I studied throughout the whole year and I didn't leave it at the end. But, I wasn't able to do that in that semester and because it was a critical year for me, the third year, I never studied like that before, I think throughout the semester it was something new for me. I didn't expect how well I would do because I studied before the exam like four or five days. So, I was so stressed about it, and I was thinking first I would fail and that there is no way I can do the whole semester in four-five days because I had a lot to do before, and as soon as I finished I took one day off, as soon as I finished my dissertation I mean and the courseworks, we had written exams, so I took one day off because it was too stressful for me." (5/Participant 19)

4.4.4.4 News events

The fourth theme, news events, consisted of three lower-order themes: social issues, political issues and environmental issues. Social issues involved stressors such as social conflicts (e.g., war and shootings), homosexuality, culture, feminism and religion. Political issues included politics and elections as well as economic crisis concerns. Environmental issues involved the weather, noise and conserving energy resources (e.g., gas, electricity, water).

In relation to news events, males focused on emotion-focused coping, i.e. acceptance of the stressor, behavioural disengagement/helplessness (e.g., giving up) or mental disengagement/self-distraction (e.g., distraction from thinking), and focusing on and venting of emotions (e.g., expression of feelings). Female younger adults employed behavioural disengagement/helplessness, denial of the stressful situation, planning and active coping, and focusing on and venting of emotions. Political issues are illustrated by the following quote:

> "I think news events were, it was about that I wasn't in my country while something important was happening there. So this period was important for my country and I wasn't there so I couldn't follow all the news and all the things and I didn't have the same opportunities to do something as I wasn't there, maybe not even to vote, I don't know. I was feeling a bit of not being in my country when something important was taking place. In a sense I was feeling guilty. Like leaving from your country when something is not going well is not necessarily …. Well, it's good for yourself but if everyone is leaving no one will fix the situation …. but as a general idea like leaving when something is not going well I don't agree …. but sometimes I feel that I could do something more for my country." (160/Participant 15)

4.4.4.5 Physical activity involvement

The fifth theme, physical activity involvement, consisted of three lower-order themes: opportunity to participate in sport, factors restricting exercise, and physical appearance. Participants referred to the opportunity of participating in sport regarding the lack of opportunity and free time to participate and lack of plethora of activities. Factors resisting exercise were associated with health and illness issues such as bad health habits (e.g., smoking, eating, gaining weight). Physical appearance was regarded as a stressor in relation to dissatisfaction with body image and physical abilities. With regard to physical activity involvement, female participants used active coping and planning, and acceptance or denial of the stressor. The following quote indicates the stressors identified within physical activity involvement:

> "You know, it's a small city. There are not a lot of activities, only chilling at house or clubbing let's say. I am not a guy for clubbing, I am not a fan of it, so I stayed home all the time and I started to smoke shisha every day. When I started it, I really decreased doing sports, like football, running and stuff like that, and there was no one there to join me and I had no activity to do. And I know it's something wrong now, and every time I say I won't smoke today and I will go for running, but at the end of the day I feel so tired, I do really wanna smoke. I know now, I can't run and in ten minutes I will be dying. And I am still young and if I am not able to run, and I am not able to do any sports and to take care of my body." (92/Participant 19)

4.4.4.6 Financial and legal issues

The sixth theme, financial and legal issues, consisted of two lower-order themes: financial concerns, and visa issues and background check requirements. Concerning

financial concerns, participants talked about payments, money for necessities, education, extras and entertainment, earning their own money, expensiveness, struggling with money, spending money for their own pleasure, and savings and budgeting. Regarding visa issues and background check requirements, these hassles were linked to unemployment, international visa expiration and criminal record checks. In relation to legal issues, both male and female younger adults dealt with by seeking instrumental social support, planning and active coping. Humour was not used as a coping mechanism neither by males or females. Female younger adults did not also deal with the stressors by turning to religion and blaming others or themselves. The following quote provides an insight into the financial concerns:

> "My rent. This is the first time, because in first year my dad paid my rent for the accommodation, so this year it's like the first time I had to pay rent, so it's like quite stressful to manage money and to know how much I can spend on everything and to like budget I guess, which is quite stressful … I had enough money for food but I know if my friends asked me to go out and I had to make sure I have had enough money to go out otherwise, and then like having to say not this time because like not having enough money is quite stressful even though I said no they might have not thought of that necessarily."
> (113/Participant 6)

4.4.5 Gender differences in SCE experiences in relation to psychosocial stressors

Regarding SCEs, male and female younger adults were likely to blame themselves and report shame and guilt about health and well-being issues because they lacked control over these stressors and could not provide help and support. Both men and women reported shame, guilt and self-blame in physical activity involvement and

news events. Shame, guilt and self-blame were also mentioned by males in relation to personal interactions and the self (e.g., organisation of time) and financial and legal issues; externalisation of blame was reported regarding career and occupation. Male and female younger adults experienced shame, embarrassment, guilt and self-blame in stressful situations where the pressure and responsibility of their actions and behaviour were on themselves.

4.5 Discussion: quantitative and qualitative findings

This section will focus on the main conclusions that can be derived from the interpretation of the quantitative and TA findings. The discussion will integrate and link these findings with the wider literature, although the literature is somewhat limited about psychosocial stressors and SCEs because they have not previously been examined using qualitative methods. The main aim of this study was to designate psychosocial stressors as ancient and modern stressors in relation to adaptation and coping. In order to do this, associations between psychosocial stressors and SCEs were examined; what life events and hassles younger adults encountered in everyday life were identified; the reasons why these psychosocial factors were experienced as stressful were investigated; and whether younger adults could adapt and deal with these stressors was explored.

4.5.1 Associations between psychosocial stressors and SCEs

Quantitative findings showed weak negative associations between the total number of life events and shame as well as guilt. These findings imply that an individual, who encounters a few life events, is likely to report higher shame and guilt. A weak positive association was found between the severity of life events and

externalisation. This implies that individuals are likely to externalise the blame to others in negative life event stressors (Dickerson, Kemeny, et al., 2004; Lewis, 1995). These findings could be explained in line with previous research, which has found that a stressful encounter could be appraised as crucial to one's moral values and self-reflection and may be associated with the elicitation of SCEs (Bulger, 2013; Reisenzein & Hofmann, 1990; Roseman, 1991; Roseman et al., 1990; Siemer et al., 2007; Weiner et al., 1982). Keller and Nesse (2006) and Keller, Neale, and Kendler (2007) argued that stressful life events (e.g., personal failures, social disagreements, breaking up romantic relationships) can lead one to express guilt. However, Lee, Anderson, and Klimes-Dougan (2016) stated that the death of a beloved person, future concerns, personal health/illness and hospitalisation make people less prone to report shame and guilt.

Regarding the total number and severity of hassles, weak positive associations were found with alpha and beta pride. One of the weaknesses of previous studies is that pride has not been examined in conjunction with the other SCEs and in relation to psychosocial stressors. However, in this study this indicative finding might be interpreted that an individual is likely to report pride (authentic or hubristic) in stressful situations with which they dealt and resulted in a positive moral self-reflection.

Psychosocial stressors were also weakly and positively associated with the overall negative SCEs (Gilbert, 2000; Gilbert & McGuire, 1998; Gruenewald et al., 2004). This implies that the higher the psychosocial stressors severity, the more likely individuals to report negative SCEs is (e.g., shame and guilt) (Cohen & Williamson, 1991; Dickerson, Gruenewald, et al., 2004; Dickerson, Kemeny, et al., 2004; Dickerson et al., 2008). Perceived stress, which constitutes a more subjective measure of stress, was weakly and positively associated with shame and externalisation (Stotz et al., 2015). From a physiological perspective, repeated experience of SCEs has had an

underlying impact on stress reactivity resulting in greater cortisol release (Kemeny et al., 2004).

As hypothesised for gender, weak positive associations were found regarding shame and guilt, and weak negative associations for detachment and externalisation. According to previous research, women in this group were likely to report greater shame and guilt in stressful situations and men were likely to detach themselves from the stressful situations and externalise the blame (Bulger, 2013; Efthim et al., 2001; Lewis & Ramsay, 1997, 2002; Pivetti et al., 2016; Siemer et al., 2007).

The theoretical implications of the present findings are in accordance with the transactional theory of stress, coping and emotions; SCEs are elicited when an individual encounters and appraises an event as stressful and evaluates whether emotions are harmful or important for their well-being and goals (Lazarus, 2006; Lazarus & Folkman, 1984b; Uji et al., 2011). Greater levels of negative emotions are associated with stressful events (Janoff-Bulman, 1979; Lewis, 1971; Smith & Lazarus, 1990). Whilst the broader literature is quite limited, these indicative findings firstly were used as a guide to explore the reasons why younger adults reported SCEs in stressful situations and secondly revealed the importance of exploring in greater depth associations between psychosocial stressors and SCEs in order to strengthen this part of research. The main difference between the present study and previous research is that this study examined a larger pool of psychosocial stressors and explored all SCEs.

4.5.2 Discussion of the inductive TA findings in younger adults

The main aim of this study was to designate psychosocial stressors (i.e. negative life events and daily hassles) as ancient and modern in relation to younger adults' adaptation and coping. Regarding the qualitative findings, inductive TA was employed

to analyse and create higher-order themes; namely, health and well-being, personal interactions and the self, career and occupation, news events, physical activity involvement, and financial and legal issues. These themes include a wide range of stressful psychosocial factors which younger adults encountered and experienced. Younger adults referred to coping mechanisms used and SCEs elicited from stressors, and also discussed the reasons why psychosocial factors were appraised as stressful in terms of adaptation and coping.

Although a bottom-up approach followed to explore psychosocial stressors experienced by younger adults, some of the themes are consistent with previous research. Previous studies have examined specific stressful events in younger adults whereas the present study focused on a wide range of stressors and organised and grouped them in lower and higher-order themes. Previous research indicates hospitalisation, illness of one's self and of a family member or friend, and bereavement to be stressful life events, which in the present study have been identified in the health and well-being theme (Eysenck, 2004; Jackson & Finney, 2002; Kaplan, Robbins, & Martin, 1983; Lewinsohn et al., 2003).

Social engagement, family-related issues, social relationships (e.g., peer and interpersonal), intimacy (Fingerman & Perlmutter, 1995; Friis, Wittchen, Pfister, & Lieb, 2002; Jackson & Finney, 2002) and movement (Lewinsohn et al., 2003) have been organised in the personal interactions and the self. This theme also added three lower-order themes: communication, independent living and maintaining home, and organisation of time. Intellectual and work-related issues and future concerns (e.g., changing or losing a job) (Eysenck, 2004; Kaplan et al., 1983) have been covered in the career and occupation theme, which has also identified the lower-order theme exams and assessment. Social problems (Jackson & Finney, 2002) have been identified in

news events along with political and environmental issues in the present study. Financial issues (Fingerman & Perlmutter, 1995) have been investigated in the present study along with legal issues. Lastly, younger adults' physical activity involvement has not been previously explored in the literature regarding adaptation and coping.

Further to TA findings, a large body of research has shown that there are gender differences in coping with psychosocial stressors (Billings & Moos, 1981; Folkman & Lazarus, 1980; Hamilton & Fagot, 1988; Marco, 2004; Pearlin & Schooler, 1978; Stone & Neale, 1984). The present study found that male and female younger adults employed both problem and emotion-focused coping strategies to deal with psychosocial stressors. However, an underlying tendency was observed for male younger adults to use more problem-focused coping regarding personal interactions and the self, career and occupation, and financial and legal issues; and for females to use more emotion-focused coping regarding health and well-being. This imply that males and females at a societal level might cope differently (Matud, 2004; Ptacek, Smith, & Dodge, 1994; Tamres et al., 2002). Lastly, shame, guilt and self-blame were the most frequently reported SCEs in relation to life events and hassles. Although literature suggests gender differences in the SCE expression (Lewis, 1995; Lewis & Ramsay, 2002), these qualitative findings showed no differences in the SCE experiences between males and females which is in line with some previous studies (Efthim et al., 2001; Pivetti et al., 2016; Siemer et al., 2007).

4.5.3 Findings of study one so far

The overall aim of this research programme is to explore the feasibility of distinguishing between ancient and modern stressors within a health context. The main aim of study one was to designate psychosocial stressors as ancient and modern in

relation to younger adults' ability to adapt and cope. This study found indicative associations between negative life events and daily hassles with SCEs. The inductive TA identified what psychosocial factors younger adults encountered and the reasons why they found these factors stressful as well as the SCEs elicited and associated with these stressors. Qualitative analysis also explored gender differences in SCE experience and coping with psychosocial stressors. Although the findings of the present study in line with previous research provided some evidence for the designation of psychosocial stressors as ancient and modern, it is believed that this evidence cannot be regarded as sufficient in order to provide a plausible rationale to provisionally designate ancient and modern stressors; thus the research question has been partially answered.

The next chapter (i.e. study one; part two) will present and discuss why this evidence has been considered as insufficient in relation to study one. It will also discuss why a different methodological approach and analysis was employed in order to explore the feasibility of provisionally distinguishing between ancient and modern stressors. Lastly, the next chapter will provide an overall discussion of the findings and limitations of both parts of study one.

Both part one and part two of study one consisted of two phases each: the first phase included quantitative data collection and analysis (i.e. questionnaires) which was followed from the second phase that involved qualitative data collection and analysis (i.e. interviews). The main differences between parts one and two are:

- In part one of study one, a larger pool of psychosocial factors (i.e. life events and daily hassles) were explored in order to designate them as ancient or modern stressors in relation to adaptation and coping. In part two, specific matched ancient and modern-designated life event stressors by Schreier and Evans (2003) were assessed in order to provisionally distinguish them in relation to psychological characteristics.

- In part one of study one, quantitative data (i.e. life events, hassles, SCEs) were analysed using correlations and qualitative data using thematic analysis in order to answer the first research question. In part two, quantitative data (i.e. specific ancient and modern stressors, SCEs) were analysed using multiple regression and qualitative data using content analysis in order to explore psychological stressor characteristics.

Chapter Five: Study One (Part Two)

Distinguishing between ancient and modern stressors: an initial exploration in younger adults

5.1 Chapter overview

Building upon the findings of the first part of study one (i.e. psychosocial stressors that younger adults experienced), the second part of study one aims to explore the feasibility of provisionally designating psychosocial stressors as ancient and modern in relation to not only adaptation and coping but also regarding other psychological characteristics (i.e. criteria); and to examine the association between this stressor distinction and SCEs. This will be done by assessing specific psychosocial stressors that younger adults encountered and could be matched with stressors from the original article from Schreier and Evans (2003). This chapter also links ancient and modern stressors with the broader stress and coping theories and research, the concept of self-conscious emotions (SCEs), and the role of gender in the stress literature. The present mixed-methods study used the questionnaires and semi-structured interviews from the first part of the study one (see chapter four). A multiple regression found that shame was best predicted by ancient stressors and gender. A deductive qualitative content analysis revealed five psychological characteristics that were found to underlie ancient and modern stressors in order to assess the feasibility of provisionally distinguishing between these stressors. This might imply that ancient and modern stressors could be distinguished in younger adults. This chapter summarises and discusses overall the quantitative and qualitative findings of both parts of study one as well as the strengths and limitations, before the main conclusions about the present study and future studies.

5.2 Introduction

5.2.1 Linking ancient and modern stressors with the broader stress literature

Having presented and discussed in the literature review chapter ancient and modern stressors (see section 2.2.6), this section will introduce and link these stressors with stress literature in order to provide a more complete picture of stress. Such an understanding is important as being able to distinguish between ancient and modern stressors could assist in conceptualising and elucidating the effect of stress on physical health.

There are established psychophysiological coping processes which enable people to adapt and deal with ancient stressors since these stressors have been an integral part of human evolutionary history. Modern stressors have been considered as evolutionarily newer and individuals have had less time to adapt and need more physiological energy to deal, resulting in higher allostatic load and greater impact on physical health (Schreier & Evans, 2003). As described in the literature review chapter, interesting points have been made about the evolutionary concept of stress by Korte et al. (2005) and Li and Kanazawa (2016) and about the notion of adaptation to stress in relation to the theory of allostasis/allostatic load (McEwen, 1998b, 2007; McEwen & Stellar, 1993; Sterling & Eyer, 1988), which could be further linked to ancient and modern stressors. This theory suggests that the organism activates psychophysiological, behavioural, neuroendocrine and immunological coping responses to deal with stressors. Unsuccessful adaptation and ineffective coping to stressors can result in wear and tear of the allostatic bodily systems (McEwen, 1998a, 1998b, 2007; Sterling & Eyer, 1988). Thus, adaptation and coping constitute two key components to distinguish between ancient and modern stressors.

According to the transactional theory of stress and coping, adaptation and coping can be regarded as an integrated concept, which is directed towards the stressor and lead to either adaptive or maladaptive coping resulting in favourable or unfavourable, event or emotion, outcomes (Carver, 1997; Carver et al., 1989; Folkman, 1997; Folkman & Lazarus, 1980, 1985; Lazarus & Folkman, 1984a, 1984b; McCrae & Costa, 1986; Rippetoe & Rogers, 1987). This is where the ancient and modern stressors concept fits into and expands the transactional model. If a psychosocial factor is perceived as a stressor and an individual is able to adapt and deal with it, this stressor could be regarded as ancient. If people are not able to adapt and deal efficiently with the stressor, it could be considered as modern.

Whilst Schreier and Evans (2003) made an initial attempt to distinguish stressors as ancient and modern from an anthropological/evolutionary perspective, very little is currently understood and developed in this area since then although there is a trend towards evolutionary explanations in psychology and concepts in stress. The present study seeks to explore the feasibility of provisionally distinguishing between ancient and modern stressors in order to bring a psychological perspective to this novel and innovative concept and further into the spotlight within psychology as this distinction might relate to health.

Schreier and Evans (2003) focused on children to make an ancient and modern stressors distinction which may be due to genetically-established coping mechanisms or may rely upon the exposure of children to stressful events which is outside their control. The present study investigated this concept from an adult perspective in order to explore younger adults' cognitive appraisals and perceptions of stressor characteristics in relation to a potential ancient and modern stress distinction (Anisman & Merali, 1999;

Dickerson et al., 2009; Dickerson & Kemeny, 2004; Lazarus & Folkman, 1984b; Maier & Watkins, 1998, 2005).

In order to assess the feasibility of distinguishing between ancient and modern stressors as no measure yet exists of ancient and modern stressors per se, established life event and hassle questionnaire ratings were used (DeLongis et al., 1988; Tennant & Andrews, 1976). These psychosocial stressors were investigated in depth regarding adaptation, coping and emotions in order to distinguish them as ancient or modern. Whilst there are many studies on and measures of life event stressors, only one study has sought to distinguish them into ancient and modern, that of Schreier and Evans (2003) which has received relatively little attention in literature; thus this distinction is far from being established.

5.2.1.1 Ancient and modern stressors and SCEs

Chapters two and four introduced the literature and research on stress and emotions relationship (Dewe, 1991; Indik et al., 1964; Kershaw et al., 2014; Schachter & Singer, 1962) and more specifically the association between stressful events and SCEs (Glanz et al., 1990; Reeve, 2009; Siemer et al., 2007; Smith & Lazarus, 1990; Tangney & Dearing, 2003). The second part of study one aimed firstly to assess the feasibility of distinguishing between ancient and modern stressors; and secondly this is the first study to examine associations between ancient and modern stressors and SCEs. It is expected that a person who is less able to adapt and deal with psychosocial stressors would experience negative SCEs because of their self-evaluation and self-reflection (Bulger, 2013). It is hypothesised that modern stressors, compared to ancient, would be associated with more negative self-reported SCEs.

5.2.1.2 Gender, coping, SCEs, ancient and modern stressors

Chapter four introduced the literature and research about the role of gender in the relationship between stress, coping and emotions (Ellsworth & Scherer, 2003; Marco, 2004; Moksnes et al., 2010; Tamres et al., 2002). Despite past research, gender differences in coping have not been yet established convincingly as literature has been complex (Porter & Stone, 1995; Thoits, 1991). For example, Folkman, Lazarus, Gruen, et al. (1986) did not find any significant gender differences in appraisal and coping with physical health. Schreier and Evans (2003) examined whether gender made any difference in their findings regarding stress responses to ancient and modern stressors; boys and girls reactions to ancient and modern stressors were similar although they did not present and discuss this finding. They did not also provide any information regarding how they examined gender, for example as a control variable or as a predictor in regression analysis. Study one aimed to investigate gender differences in coping with ancient and modern stressors in order to explore if coping and adaptation enable individuals to deal more efficiently with ancient rather than modern stressors.

The previous chapter also discussed gender differences in psychosocial stressors and SCEs (e.g., shame and guilt) (Efthim et al., 2001; Lewis, 1995; Lewis & Ramsay, 2002; Pivetti et al., 2016). Although the research on gender differences and SCEs is limited, this study aimed to examine gender differences in SCE experiences regarding ancient and modern stressors. From a review of the current research, future work needs to examine gender differences in ancient and modern stressors; how these are coped with and what emotions are displayed in response to them.

Gender has been also considered and tested as a moderator in stress research. For example, although it has been tested as a moderator in the relationship between stress and social support (Israel-Cohen & Kaplan, 2016; Wohlgemuth & Betz, 1991)

and between psychological distress and alcohol use (Geisner, Larimer, & Neighbors, 2004), it has not been extensively used as a moderator within the stress and emotions context; no significant moderating results were found in the relationship between stress and emotions in adolescents (Moksnes et al., 2010).

The present study will explore gender differences in coping with ancient and modern stressors and in SCEs. It is expected that men and women would differ in coping and SCE experiences in terms of ancient and modern stressors. More specifically, men would be likely to use problem-focused coping and women emotion-focused coping with ancient and modern stressors. It is expected that men and women would be less able to deal with modern than ancient stressors resulting in both to experience greater shame and guilt. This study also examines if gender moderates the ancient and modern stressors and SCEs relationship.

5.3 From the inductive to the deductive qualitative analysis

In order to provisionally designate life events and daily hassles as ancient and modern stressors, which was the main aim of study one, adaptation and coping were considered. It was expected that with those psychosocial factors younger adults could adapt and deal could be assigned as ancient stressors, and with those stressors that individuals were less able to adapt and deal could be regarded as modern. The inductive thematic analysis (TA) of the interviews provided an exploratory way to identify which negative life events and daily hassles younger adults encountered and experienced as stressful. In this way, the psychosocial stressors were organised into higher-order themes. The interviewed participants discussed the reasons why life events and hassles were appraised as stressful; whether they could adapt to these stressors; what coping mechanisms they used to deal with them; and what the SCEs were they experienced.

However, the initial attempt to designate psychosocial stressors as ancient and modern only in relation to adaptation and coping provided some plausible justification and moderate level of confidence which needed to be stronger. There was more variation in the appraisal, adaptation and coping not only between the psychosocial stressors, but also within each stressor. It was expected that people would adapt and deal efficiently with ancient stressors, whereas with modern stressors they would need more time to adapt and would be less able to deal. Figure 5.1 presents an example of this initial attempt to provisionally designate life events and hassles as ancient and modern stressors regarding adaptation and coping. Each quote for every life event and hassle was placed in the adaptive coping category (indicating an ancient stressor) or in the maladaptive coping category (indicating a modern stressor) (see Appendix D). Adaptive coping was expected to lead individuals to favourable outcomes and maladaptive coping to unfavourable outcomes. The findings from this analysis were encouraging but not sufficient to ensure a provisional ancient and modern stressors designation.

This designation would be difficult to be made at this point of the study because of the level of evidence (i.e. quotes per each life event and hassle) which varied from strong, moderate, weak and no evidence. A low level of evidence would not allow a high level of confidence to provide a reasonable justification and support for this provisional stressor distinction as ancient and modern. For this reason, another in-depth qualitative approach (i.e. deductive CA) was considered as more appropriate to be employed in order to assess the feasibility of provisionally distinguishing between ancient and modern stressors through the exploration of psychological stressor characteristics that underlie the life events that have been a priori designated as ancient and modern stressors from Schreier and Evans (2003).

Items	Quotes	Coping	Outcome	Stressor designation
Life event 46: You had a big change in the hours you had lectures/worked.	'I think is by keeping it into like maybe like an agenda.'	Adaptive (active coping)	Favourable	Ancient (?)
	'Sometimes, I was getting overwhelmed but then I just I find ways to motivate myself to work. I do some exercise which helps me, like take my mind off work which is good. I do some yoga which is really good to relax myself. I tried to take breaks for a while, to relax, listen to music, things like that.'	Adaptive (active coping)	Favourable	
	'Definitely, I adapted to that life event.'	Adaptive	Unfavourable (no evidence)	
Hassle 23: Your smoking.	'Then I came to a point where I actually found myself weakened which was last year when I told myself I can't actually stop smoking even if I want to. Now I can't stop smoking and I think it has affected my life, it has affected my brain, my concentration.'	Maladaptive	Unfavourable	Modern (?)
	'I started to smoke shisha every day. When I started it, I really decreased doing sports, like football, running and stuff like that, and there was no one there to join me and I had no activity to do.'	Maladaptive	Unfavourable	

Figure 5.1. Indicative example of the initial attempt to provisionally designate psychosocial stressors as ancient and modern in relation to adaptation and coping.

5.3.1 Psychological stressor characteristics

This section will introduce the characteristics that were explored and enabled to distinguish between ancient and modern stressors. Stressor characteristics are those psychological factors (e.g., appraisal, severity, exposure, control, preparation, lack of previous experience) that along with biological factors (e.g., age, gender and genetics) influence individuals' physiopsychological response to stressful events and can affect physical health (Anisman & Merali, 1999; Rabkin & Struening, 1976; Schneiderman et al., 2005). For example, appraisal refers to how one perceives and deals with a stressor (i.e. harm, loss, challenge, self-evaluative threat/social judgement) which could lead to negative emotional responses and physical health outcomes (Blascovich & Tomaka, 1996; Dickerson et al., 2009; Dickerson & Kemeny, 2004; Dienstbier, 1989; Lazarus & Folkman, 1984b). The rationale for looking at characteristics lies in the previous weak evidence surrounding ancient and modern stressors. Exploring and assessing how individuals appraise ancient and modern stressors might reveal potential specific characteristics that underlie ancient and modern stressors. This will also provide a defensible justification to assess the feasibility of provisionally distinguishing between ancient and modern stressors.

In order to explore through the deductive qualitative CA any potential common stressor characteristics that underlie ancient and modern stressors, all the relevant quotes for each life event item were collected and coded in relation to the characteristics of: predictability and controllability, novelty, type of stressor, duration, adaptation and coping. Evidence for potential underlying associations between SCEs and ancient and modern stressors was also explored.

Predictability and controllability refer to the expectedness and manageability of the stressor or the unexpectedness and lack of control over the stressor (Abbott, Schoen,

& Badia, 1984; Arthur, 1986; Bollini, Walker, Hamann, & Kestler, 2004; Henry & Grim, 1990; Maier & Watkins, 2005; Mason, 1968; Sapolsky, 1994). Successful adaptation and coping have been considered more difficult when the stressor is uncontrollable and an individual has not previously experienced it (Haan, 1993, 2013). Novelty refers to a more recent to the human evolutionary history stressor because of modern life (e.g., unemployment) that individuals have not encountered and experienced before, compared to stressors that have been an integral part of human experience and evolution (e.g., bereavement) (Pace, Cole, Ward, Kalman, & Spencer, 2001; Rose, 1980; Thompson & Spencer, 1966).

Type of stressor is divided in six categories: acute; chronic; psychological (e.g., death of a beloved, anticipating an adverse event, caring); physical (e.g., headache, bodily injury, recovery from surgery); processive which requires cognitive processing of incoming sensory information; and systemic which is of physiological origins (Anisman & Merali, 1999). Duration refers to the chronicity of a stressor (i.e. short or long period of time) and timing to the frequency of a stressor (i.e. intermittent or continuous) (Anisman & Merali, 1999). Adaptation and coping is divided into two categories: adaptive coping (i.e. problem-focused; emotion-focused; meaning-based coping: positive reappraisal, revising goals and planning goal-directed problem-focused coping, activating spiritual beliefs and experiences, transforming ordinary events into positive) and maladaptive coping (Carver, 1997; Carver et al., 1989; McCrae & Costa, 1986; Rippetoe & Rogers, 1987), which can result in favourable resolutions, or unfavourable event or emotion outcomes, or no resolution (Folkman, 1997; Folkman & Lazarus, 1980, 1985; Lazarus & Folkman, 1984a, 1984b).

5.3.2 Aims of study

The main aim of the second part of study one is to assess the feasibility of provisionally distinguishing between ancient and modern stressors within a health context in relation to stressors' psychological characteristics.

As has already been discussed, in order to designate psychosocial stressors as ancient and modern, the degree of adaptation and coping with stressors was taken into account through the inductive TA. However this approach was not considered as sufficient evidence to provisionally distinguish between the stressors in terms of adaptation and coping. For this reason, the a priori designated ancient and modern life event items from the Schreier and Evans (2003) list have been matched with those life event items from the LEI list that was used in the present study; this approach makes the provisional distinction between ancient and modern stressors more robust.

Once this designation is made, associations between the designated ancient and modern life event stressors with SCEs are examined through correlations and multiple regression. Deductive qualitative CA has been employed: i) to explore in greater depth whether there are any potential common psychological characteristics (criteria) that underlie ancient and modern stressors; and ii) to identify whether coping with the stressors and SCE experiences differ between males and females. The quantitative and qualitative parts are vital to assess the feasibility of provisionally distinguishing between ancient and modern stressors in relation to psychological characteristics. The rationale for the second part of study one originates from the insufficient evidence regarding the ancient and modern stressors distinction. The diagram below illustrates the design and implementation of the present study (Figure 5.2).

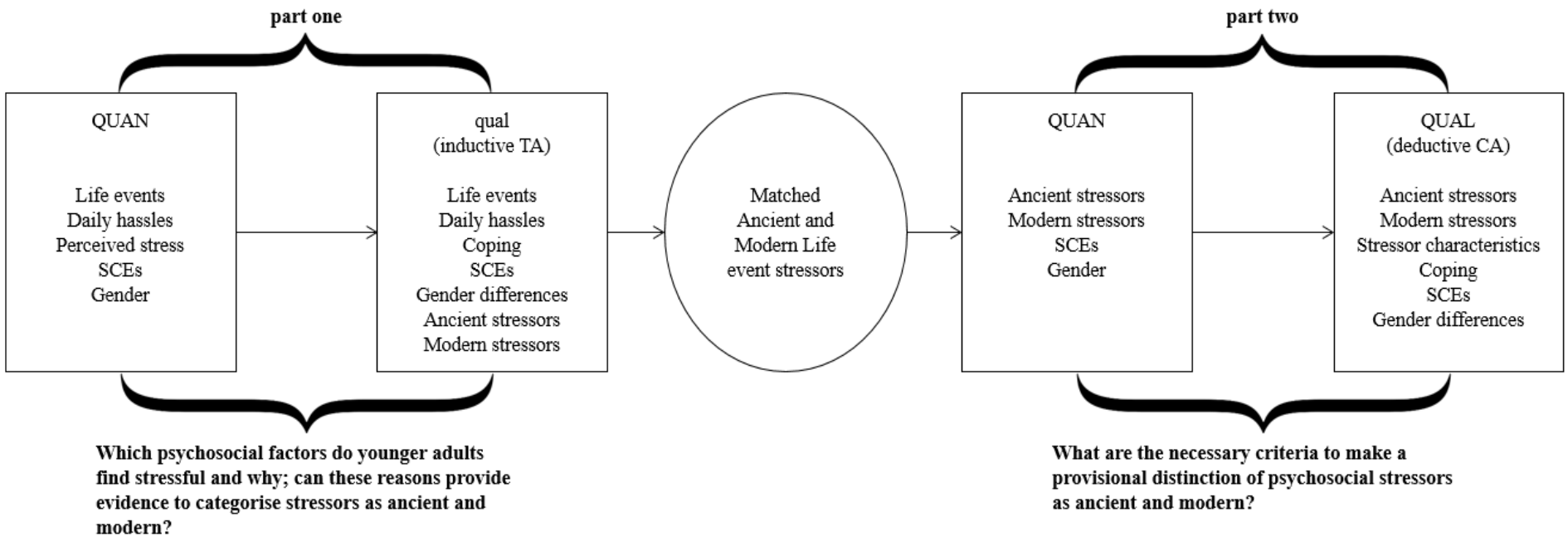

Figure 5.2. Diagram of the step by step procedure employed in the sequential mixed-methods study one.

5.3.3 Hypotheses of quantitative phase of the second part of study one

In order to examine associations between ancient and modern stressors with SCEs in younger adults, the hypotheses are as follows:

1. Ancient and modern life event stressors will be associated with negative SCEs.

1a. The total number of modern stressors will be a stronger positive predictor of negative SCEs than the total number of ancient stressors.

1b. The severity of modern stressors will be a stronger positive predictor of negative SCEs than the severity of ancient stressors.

2. Gender (both males and females) will exacerbate as moderator the relationship between ancient and modern stressors with negative SCEs.

5.4 Method

All the pertinent information about design, participants, recruitment, measures, procedure and ethical considerations of study one have been covered in chapter four (see sections from 4.3.1 to 4.3.5). In order to provide a plausible and defensible justification to provisionally distinguish between ancient and modern stressors, a more narrow-focused approach was followed taking into consideration the a priori ancient and modern stressors designation from Schreier and Evans (2003). The life event items from the Schreier and Evans list were matched with those life event items from the LEI list, which were at least to some extent similar in meaning (Table 5.1). Regarding this approach, only those life event items related to Schreier and Evans list were used.

Table 5.1

Matching life event items between Schreier and Evans and LEI lists

Schreier and Evans life events	Ancient/Modern	LEI
Another relative died with whom the child had a very close relationship.	Ancient	1. A close family friend or relative died (e.g., aunt, uncle, grandparent, cousin, etc.).
A parent lost his/her job or has been unemployed.	Modern	2. You have been unemployed and seeking work for a month or more.
A parent, brother, or sister died.	Ancient	3. A close family member died (e.g., partner, sibling, etc.).
Our family had serious financial problems.	Modern	4. You had a major financial crisis.
A close family member had a serious medical problem (illness or accident) and was in the hospital.	Modern	5. You had a serious illness, injury or operation needing hospitalization, (or a month or more off university).
Our family has had to move a lot.	Ancient	6. You moved to Bath from Europe/overseas. You moved house in Bath.
A close family member was badly hurt or sick (but not in the hospital).	Ancient	7. A close relative had a serious illness (from which they did not die).
Our child was upset by family arguments. Our child has been involved in serious family arguments. Close family members have had serious arguments with each other.	Ancient	8. There has been increasing serious arguments with your partner. You had increasing arguments or difficulties with your partner (or steady friend). There has been a serious increase in arguments or problems with someone who lives at home (excluding your partner).
A close family member was away from home a lot. Our child's best friend moved away.	Modern	9. You have been separated from your partner for more than a month because of personal difficulties. You have been separated from your partner for more than a month (for reasons other than relationship difficulties). You have been separated from someone important to you (other than close family members).

Note. The Ancient/Modern indication presents the designation of life events items, as such classified by Schreier and Evans (2003).

This resulted in a reduction to nine life events which were quantitatively analysed; five ancient and four modern life events. However, this allocation has been provided with empirical basis from Schreier and Evans (2003). The approach that was followed was vital to assess the feasibility of provisionally distinguishing between ancient and modern stressors. Once this designation was made, associations between ancient and modern stressors and SCEs were examined, and gender differences in coping and SCE experiences in relation to ancient and modern stressors were explored.

5.4.1 Analytical plan

5.4.1.1 Statistical analysis

Inferential statistics using Pearson's *r* correlations were conducted to examine associations between the total number of ancient and modern life event stressors and SCEs, and between the mean severity of ancient and modern life event stressors and SCEs. Multiple regression analyses were conducted to examine if SCEs were best predicted by the total number and severity of ancient and modern stressors and gender. The IVs/predictors were the total number and mean severity of ancient stressors, total number and mean severity of modern stressors. The DVs/outcomes were the SCEs.

In order to determine whether gender moderated the relationship between ancient and modern stressors and SCEs, variables were centered at their grand mean prior to calculation of interaction terms (ancient stressors × gender; modern stressors × gender) (Figure 5.3). Moderation analyses were conducted using simple regression analyses entering the predictor, moderator and their interaction term in the first block (Aiken, West, & Reno, 1991; Baron & Kenny, 1986; Howell, 2013).

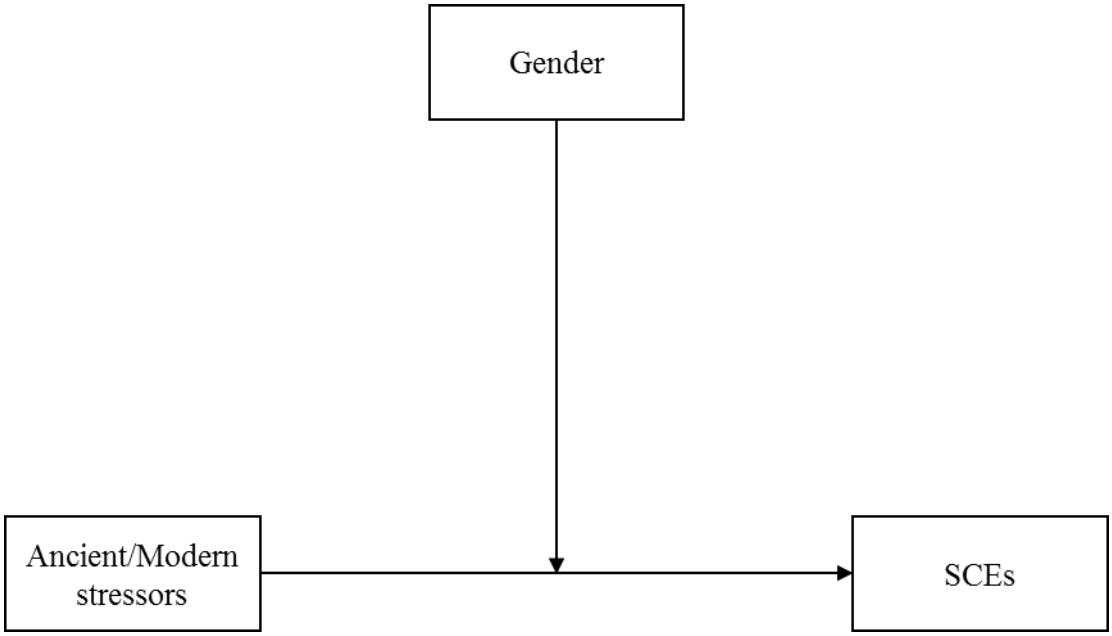

Figure 5.3. Diagram of conceptualisation of gender as moderator of the ancient and modern stressors and SCEs relationship.

5.4.1.2 Content analysis

The main aim of this qualitative analysis was to assess the feasibility of provisionally distinguishing between ancient and modern stressors in relation to psychological characteristics using a deductive, directed, latent CA approach (see chapter three) (Bengtsson, 2016; Hsieh & Shannon, 2005; Mayring, 2014; Vaismoradi et al., 2013). The text passage of each life event (from Table 5.1) was thoroughly examined to identify any common psychological characteristics that underlie ancient and modern stressors. Each life event had been considered as ancient or modern stressor based on the a priori designation from Schreier and Evans (2003). Secondary aims were to explore any gender differences in coping and SCEs regarding ancient and modern stressors.

5.5 Results

5.5.1 Data screening

Prior to conducting correlations and multiple regressions, data screening was conducted and assumptions were tested. Approximate normality of the data was assessed using histograms (with normal distribution curves), mean skewness and kurtosis scores and the Kolmogorov-Smirnov normality test. Using square root transformation, logarithm 10, and inverse, histograms did not show a better distribution close to normal curves. However, the standardised residuals (errors) were approximately normally distributed and the residual and scatter plots showed oval shaped patterns in the variables of interest (Dancey & Reidy, 2011; Field, 2013; Ghasemi & Zahediasl, 2012; Hair et al., 2010; Tabachnick & Fidell, 2007).

5.5.2 Preliminary analyses

The summary statistics and Pearson's *r* correlations between the variables of interest are presented in Tables 5.2 and 5.3. Significant negative associations were found between the total number of ancient and modern life event stressors with shame (hypothesis 1).

Table 5.2

Correlational and descriptive data for predictor variables (N = 98)

Psychological variables	1	2	3	4	5	*Mean (SD)*
1. Total number Ancient Life events	-	.183	.527***	.377***	-.162	2.88 (1.78)
2. Mean severity Ancient Life events		-	.117	.171	.049	3.69 (1.51)
3. Total number Modern Life events			-	.722***	-.186	.96 (1.08)
4. Mean severity Modern Life events				-	-.099	2.17 (2.17)
5. Gender					-	-

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Table 5.3

Correlations between ancient and modern stressors and SCEs (N = 98)

Psychological variables	Shame	Guilt	Detachment	Externalisation	Alpha pride	Beta pride	Negative SCEs
Total number Ancient Life events	-.401***	-.184	.270	-.040	-.013	-.021	-.138
Mean severity Ancient Life events	-.049	.010	.154	.019	-.136	-.143	-.015
Total number Modern Life events	-.259**	-.159	.170	.040	.012	-.004	-.073
Mean severity Modern Life events	-.152	.073	.176	.013	.197	.175	.102

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

5.5.3 Inferential statistics

5.5.3.1 Main effects

Regarding hypothesis 1a, a multiple regression was conducted with shame as DV. Using the enter method, the total number of ancient and modern life event stressors, and gender were entered at step one as the predictors. Results revealed that the total number of ancient stressors and gender contributed significantly to the regression model ($R^2 = .22$, $F(3, 94) = 8.85$, $p < .001$) and accounted for 20% of the variation in shame. The analysis showed that the total number of ancient stressors ($p = .002$) and gender ($p = .011$) were significant predictors of shame (Table 5.4) (Field, 2013).

Table 5.4

Summary of multiple regression analysis for variables predicting shame (N = 98)

Predictors	*B* (*SE*)	β	*t*(*df*)	95% CI
Total number Ancient Life events	-.116 (.036)	-.344	-3.20(3, 94)**	-.188, -.044
Total number Modern Life events	-.018 (.060)	-.033	-.304(3, 94)	-.137, .100
Gender	.295 (.113)	.243	2.61(3, 94)*	.071, .520

Note. *B*: unstandardized coefficient; *SE*: standard error; β: standardized coefficient; *df*: degrees of freedom; 95% CI: confidence intervals; DV/outcome: shame; Gender, coded: 1 = Male, 2 = Female; $R = .469$; * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Indicative correlations did not reveal any significant associations between the severity of ancient and modern life event stressors and negative SCEs (hypothesis 1b).

5.5.3.2 Moderation effects

Regarding hypothesis 2 and considering the multiple regression findings, moderation analysis was conducted using simple regression to examine the interaction between the total number of ancient stressors and gender (p = .996), and total number of modern stressors and gender (p = .854) on shame. No interaction effects were found.

5.5.4 Qualitative CA findings

In order to assess the feasibility of provisionally distinguishing between ancient and modern stressors, a deductive qualitative CA was conducted in the matched life event stressors (from Table 5.1). CA revealed five psychological characteristics that were found to underlie ancient and modern stressors: coping, experience, manageability/expectedness, duration and type of stressor. The categories and definitions that represent a stressor as ancient or modern are presented in Table 5.5.

To ensure rigour, reliability, trustworthiness of coding and designation of life events, and avoid bias, an inter-rater reliability test was conducted. Five researchers independently categorised a sample of random quotes into the ten characteristics' categories. The overall criterion of agreement/consensus on the coding showed an almost perfect inter-rater reliability agreement, $\kappa = .81$, $p = .001$, 95% CI [.653, .973] (Altman, 1990; Fleiss, Levin, & Paik, 2003; Landis & Koch, 1977). This implies that quotes categorised only on the left side of the continuum confirmed the direction of the stressor as more ancient, and quotes on the right side reflected the stressor as more modern. This inter-reliability accords with the a priori designation from Schreier and Evans.

Table 5.5

Definitions of stressor characteristics' categories

Adaptive: Quotes indicate or imply any form of adequate, available, functional, constructive, protective, appropriate, effective, successful coping strategies, which result in a favourable outcome illustrating a resolved stressor.	← **1. Coping with stressor** →	**Maladaptive:** Quotes indicate or imply non-coping, problematic, less adaptive, dysfunctional, unsuccessful, less effective coping strategies, which result in an unfavourable outcome illustrating an unresolved stressor. Individuals would be less able to adapt and deal with a stressor.
Past: Quotes indicate or imply that individuals have encountered the stressor before. Based on an evolutionary perspective, a stressor that has been an integral part of the human experience from the beginning can be regarded as innate to individuals.	← **2. Experience of stressor** →	**Novel:** Quotes indicate or imply uncertainty, unfamiliarity or dishabituation to a stressor. Based on an evolutionary perspective, a stressor that has been more recent to the human experience can be regarded as more modern to individuals.
Controllability/Predictability: Quotes indicate or imply predictability or control over the stressor. The stressor was potentially expected to occur.	← **3. Manageability/Expectedness of stressor** →	**Uncontrollability/Unpredictability:** Quotes indicate or imply unpredictability or lack of control over the stressor. The stressor was not expected to occur.
Short: Quotes indicate or imply that the stressor lasted for a short period of time or had intermittent frequency.	← **4. Duration of stressor** →	**Long:** Quotes indicate or imply that the stressor lasted for a long period of time or had continuous frequency.
Simple: Quotes indicate or imply that individuals encountered a specific stressor, which had not been affected by other several stressors.	← **5. Type of stressor** →	**Complex/Multiple:** Quotes indicate or imply that individuals encountered a series of stressors. The whole stressful situation was more complex because of the presence of multiple stressors, which escalated the experience of the stressor.

The characteristics for ancient stressors were: adaptive coping, past experience, controllability/predictability, short duration, and simple stressor. The characteristics for modern stressors were: maladaptive coping, novel experience, uncontrollability/unpredictability, long duration, complex and multiple stressors. The scrutiny of life events' descriptions revealed common psychological characteristics which mainly underlie either the ancient or modern stressors. Coding of random quotes from life event stressors into the categories is presented in Table 5.6 providing evidence for the designation of stressors as ancient and modern in relation to psychological characteristics. CA and coding did not find evidence that the appraisal of stressors and timing may constitute characteristics in relation to ancient and modern stressors. However, the analysis indicated that younger adult individuals experienced acute and chronic psychological and physical stressors.

The ancient-designated life event "A close family member died (e.g. parent, sibling, etc.)" and the modern-designated life event "You had a major financial crisis" have not been experienced by younger adults. However, an ancient and a modern life event stressor are presented as indicative examples in relation to their psychological characteristics, which enabled to provisionally distinguish them. Table 5.7 presents a series of illustrative quotes into the characteristics' categories which supports the designation of the life event "A close family friend or relative died (e.g., aunt, uncle, grandparent, cousin, etc.)" as ancient stressor. Table 5.8 presents evidence to support the designation of the life event "You have been unemployed and seeking work for a month or more" as modern stressor. The selection of these two life event stressors was random.

Table 5.6

Sample of quotes' coding into the psychological stressor characteristics

Quotes	Life event	Stressor characteristics	Designation
There isn't too much to do about it personally because I think what is done it's done for dementia. We do take him to see a doctor and staff but it's just every six months a check-up.	Health/illness of others	Adaptive coping	Ancient
Well, you know, these things happen all the time. All I need to do is to talk to her. If you talk to each other, you will find a solution always… probably.	Social/interpersonal arguments	Adaptive coping	Ancient
Health problems are in our everyday life. I cannot stress out that much each and every time. I was stressed the first time… about six years ago. I didn't know back then, but now it's okay. I know that as they grow older we are going to face such situations.	Health/illness of others	Past experience	Ancient
No, definitely it wasn't the first time. I've been in a relationship before and you know that there will be arguments from time to time. It's in our nature.	Social/interpersonal arguments	Past experience	Ancient
My grandfather needed to do a surgery. Not something very serious but still it was a surgery. It was planned about two months in advance so all the family had been emotionally prepared. We did know what to expect. Thank God all went well for all of us.	Health/illness of others	Controllability/Predictability	Ancient
... at the same time something that should potentially happen at any point if you have a shared house.	Social/interpersonal arguments	Controllability/Predictability	Ancient
It wasn't stressful. I felt… I think it was just sadness at that moment. When she admitted to the hospital, I was relieved and actually she got out the next day. She was back with us again.	Health/illness of others	Short duration	Ancient

Table 5.6 (continued)

Quotes	Life event	Stressor characteristics	Designation
So we actually stopped talking for a while because of that.	Social/interpersonal arguments	Short duration	Ancient
I don't really do anything but to stress out about it.	Health/illness of others	Simple stressor	Ancient
Quite stressful, quite anxiety-provoked, quite anxious …, not pleasant …. but it was just this thing.	Social/interpersonal arguments	Simple stressor	Ancient
I just got really upset, really. But there wasn't anything I could do. I just got quite down about it and stressed out for weeks. No, I didn't adapt easy. It's kind of going worse.	Health/illness of self	Maladaptive coping	Modern
So, it was quite hard having to like saying goodbye to them and then leave them… to move to a new country and… start again with like new friends and all of that. Of course, I didn't like it. How would I? I didn't want to leave. I was avoiding it.	Separation/distance	Maladaptive coping	Modern
It was… the procedure like because I was living on campus last year and then I flight back home in summer so there have been a lot of things I had to plan by myself in the sense that I need to pack my stuff, store, find a reliable storage in here and because I didn't want to like do the heavy lifting by myself I tried to find people who deliver and collect as well. It was a lot of logistics to think about and it was very stressful because it was either really really expensive or they did either storage or delivery and they didn't do both. At the end, I didn't know what to do. I was desperate.	Movement	Maladaptive coping	Ancient

Table 5.6 (continued)

Quotes	Life event	Stressor characteristics	Designation
So this year it's like the first time I had to pay rent, so… it's like quite stressful to manage money and to know how much I can spend on everything and to like budget I guess, which is quite stressful… I had enough money for food but I know if my friends asked me to go out and I had to make sure I have had enough money to go out otherwise… and then like having to say no this time because not having enough money is quite stressful even though, I said no they might have not certainly thought of that.	Financial problems	Novel experience	Modern
I haven't experienced before such a pain. I twisted my knee and one of my crucial ligaments was destroyed… was tore apart. I really wish I had not experienced this injury.	Health/illness of self	Novel experience	Modern
It was like the first time that it was so big and for a longer period.	Separation/distance	Novel experience	Modern
I moved because after my placement year I came back to Bath and just moving I leaved alone for the first time. It was quite stressful because just having to organise everything , just the physical stuff, just that I have to move everything into my new flat which was on the fourth floor. So I was physically exhausted and stressed and mentally as well because I like… it was the final year I wanted to make the most out of it. Thinking about it and actually moving as well made me stressed until it was done.	Movement	Novel experience	Ancient

Table 5.6 (continued)

Quotes	Life event	Stressor characteristics	Designation
It's funny because at one moment you're driving and later you wake up at the hospital being at the ER. No, it's really scary. And stressful. I had that car accident. One time you are safe and fine and five mins later you don't know what happened and why and how.	Health/illness of self	Uncontrollability/Unpredictability	Modern
We were about to go to… and start our internships, in the same city, same company… to live together at the same flat. And then he decided to decline this offer and accept another one. What would you expect me to do? I was lost. It came out of nowhere.	Separation/distance	Uncontrollability/Unpredictability	Modern
Actually in the middle of the second semester, last year, our landlord decided to sell the flat without being noticed before and without letting the agency to know it. We have been four of us and they gave us a deadline to leave the flat within six weeks time.	Movement	Uncontrollability/Unpredictability	Ancient
… that's very serious injury that if someone wants to keep on playing sports or being physically active, in the way I was, you definitely need surgery …. that meant that I was lying on bed after the surgery for two months, and then keep resting six to seven months.	Health/illness of self	Long duration	Modern
We had been separated from each other for about six months …. I did not find it easy to adapt to this situation. I was weaker, quite attached to her, I didn't know what to do. I was missing her.	Separation/distance	Long duration	Modern
The actual movement should have lasted about three weeks… going back and for all the time to move stuff. I didn't have anyone to help me. All the other arrangements might have been taken over a month. You know leaving a house, finding another flat, speaking to agents, dealing with problems.	Movement	Long duration	Ancient

Table 5.6 (continued)

Quotes	Life event	Stressor characteristics	Designation
Just think of it… They said me that I would need a surgery and I don't know for how long recovery. I also needed to pay for the surgery. I asked to go back to my country and have the surgery there but the doctor did not allow me. My parents could not support me financially at that moment, I mean to pay the full amount of the surgery and also my grandmother got worse in her health. So my mum didn't know if she should have been with me or with her mother.	Health/illness of self	Complex/Multiple stressors	Modern
It was really tough and stressful. It wasn't just leaving your home, family, friends, boyfriend… it was more than that. It was moving somewhere else, trying to be independent and safe… and all this emotional pressure.	Separation/distance	Complex/Multiple stressors	Modern
It was everything… the whole process. It was the people in the situation and the environment around me which made it quite stressful and finding a new place to move, to telling the other people that I was moving out and negotiating with the letting agency and stuff like that because it was so sudden. They didn't expect you to move next week.	Movement	Complex/Multiple stressors	Ancient

Table 5.7

Quotes and stressor characteristics supporting the ancient designation of the life event 1. "A close family friend or relative died"

Quotes	Stressor characteristics
I was more mature now in a way and relied more in my family, kind of everyone got together and just kind of grieving together.	Adaptive coping
I still have the idea in my mind, whenever I go back to my home country that I will have the opportunity to meet him and to talk to him. I know that it's not like that but it kind makes me feel more relaxed if I think about it. I think it's nice to think that I will have him by my side and even though he is not there, I know that.	Adaptive coping
But I guess we have our own lives and we think our grandparents are there and suddenly they are not. I think I adapted quite quickly, I just had to go back to the University and just kind of life went on.	Adaptive coping
I am sure it would be quite different if a parent died …. It didn't really affect me at all.	Adaptive coping
… we went through it as a family, all together so after a while it was okay, it was bearable. Not being alone, crying a lot helped. I would say that because he was not well before that, that's why I adapted easily.	Adaptive coping
... I have lost other relatives before.	Past experience
I had experienced it before with my grandfather … when my grandfather died, which was about seven-eight years ago.	Past experience

Table 5.7 (continued)

Quotes	Stressor characteristics
It was the closest relative that I have lost till now.	Past experience
No, it wasn't the first time. I have experienced it before…	Past experience
My grandfather died in January last year and he was ill for two years so it was quite expected.	Controllability/Predictability
… one of my grandfathers died . We expected this because he was very old.	Controllability/Predictability
… I wasn't that close with him so the event didn't really impact me at the time and several weeks later I just got back to normal.	Short duration
… when my grandmother died …. And she was sick the last days…	Short duration
About a year ago, my grandfather died.	Simple stressor
My grandparent, he died. I had too many projects, so I just pushed through it I guess.	Simple stressor
This was, I think, this was over a year, about one year ago and my grandfather died, and it was obviously a quite stressful time.	Simple stressor

Table 5.8

Quotes and stressor characteristics supporting the modern designation of the life event 2. "You have been unemployed and seeking work for a month or more"

Quotes	Stressor characteristics
At some point, I thought that must be something wrong with me and this actually led me to be highly demotivated towards applying for other jobs or going out with friends.	Maladaptive coping
When looking for jobs, it was a very anxious and stressful period of my life …. I think I was very upset for one or two months. I didn't really do anything to cope with it. I just got over it. I had to deal with this uncertainty.	Maladaptive coping
I think it's more about the idea that I would be a failure in my life. I fail at something and my father whose approval I so much seek would never come.	Maladaptive coping
When I actually started applying for jobs I thought that it would be quite easy …. when I came face to face with the cruel world of commercial awareness and the industrial market I saw that it is actually quite different and difficult…	Novel experience
I applied for a lot of companies since last year, but there were all rejections straight away, no interviews, nothing. So, that was something very hard to deal with.	Novel experience
It was the first time that I applied I think for three or four placements… So it was really intense and time was pressing.	Novel experience
I was at the age that some of my friends were working or studying but I wanted to feel like I work now and the fact that I couldn't find a job it was quite stressful and depressing because I wanted to do something but I couldn't find anything for ages.	Uncontrollability/Unpredictability
It was so stressful for me because I can't stay in this country anymore, my visa expires and I have to go back home, I had no place to live in so I had to find a job and it was so hard.	Uncontrollability/Unpredictability

Table 5.8 (continued)

Quotes	Stressor characteristics
… it took me more than six months to understand this kind of concept and it still appears quite scary because if I find a job it doesn't really depend upon me but it's a decision that relies upon the person and as I don't have any control over him/her.	Uncontrollability/Unpredictability
The longer it went on without having one I did get more and more stress because time was pressing on and I didn't have that long. I felt pressure to find out quickly.	Long duration
I was looking for job about seven-eight months with gaps but that was all the time I was looking for employment and I hadn't found anything.	Long duration
… I have been trying to find a job since last February but…	Long duration
And it was very stressful because I remember that we had to apply for placements till the end of November where the deadlines were and then in a month's time we had five deadlines.	Complex/Multiple stressors
That was when I took my gap year because I didn't get the grades to get into the University so I knew that I had had to get a job and start working, earning any money but just couldn't find any for ages.	Complex/Multiple stressors
As an international student, for us it's so hard to find a job and at the same time if I won't find a job I can't go back to my country because my country has some problems over there …. my visa expires ….	Complex/Multiple stressors

Coding of ancient stressors indicated that in most of the cases younger adult individuals could adapt and deal with the stressor; this adaptive coping resulted in a favourable outcome. Ancient life event stressors could not be considered as novel because individuals had experienced it before. Younger adults could also take control over the stressor (controllability) and in some cases the stressor was expected to occur (predictability). These stressors lasted for a short period of time (duration). Individuals referred to ancient stressors as they experienced a specific stressful situation and not a series of stressors which affected one another.

Regarding modern stressors, younger adults could not readily adapt and effectively deal with these stressors; maladaptive coping might have led to unfavourable resolutions. Modern stressors could be regarded as novel because of the uncertainty and unfamiliarity individuals faced with these life events. For this reason, individuals could not take control over the stressor (uncontrollability) and could not predict that it might take place (unpredictability). Modern life event stressors lasted or was sustained for a long period of time (duration) or had continuous frequency. Time pressure was also considered as an important underlying factor for modern stressors. In the majority of the cases, younger adults experienced a series of several stressors and not particularly one specific stressor; this implies that the whole stressful situation was more complex because of the presence of other multiple stressors.

These psychological characteristics cannot be regarded as conclusive for ancient and modern stressors. It is the characteristics that underlie a stressor to a great extent and make it move across the continuum either more on the ancient or modern side. The present findings confirmed the stressors designation from Schreier and Evans (2003), however they do not allow at this point of research the re-assignment of ancient and modern stressors. For example, the life event of movement in the present study had

been designated as ancient stressor according to Schreier and Evans (2003). However, younger adult participants referred to the whole process of movement and the psychological characteristics associated with this stressor suggested that it might best fit into the modern side of the continuum. The likelihood of a potential re-designation of this life event stressor will be further explored in future studies.

Figure 5.4 provides information for younger adults regarding the frequencies of ancient and modern stressors that fall into each stressor category. The life event stressor of movement (no 6) falls mainly into the more modern side of the continuum. This figure using the evidence of the present study indicates a provisional distinction between ancient and modern stressors regarding psychological characteristics. Also, each interviewed younger adult participant and life event stressor were allocated along a severity Likert scale that was adopted from the LEI (Figure 5.5). This figure provides information about how stressful was each life event as such reported from younger adults. Younger adults appraised the ancient-designated stressors as slightly/moderately stressful and the modern-designated stressors as very/extremely stressful. A plausible explanation would be that individuals appraised ancient stressors as less stressful due to their ability to adapt and deal and modern stressors as more stressful because of being less able to adapt and deal with these life events.

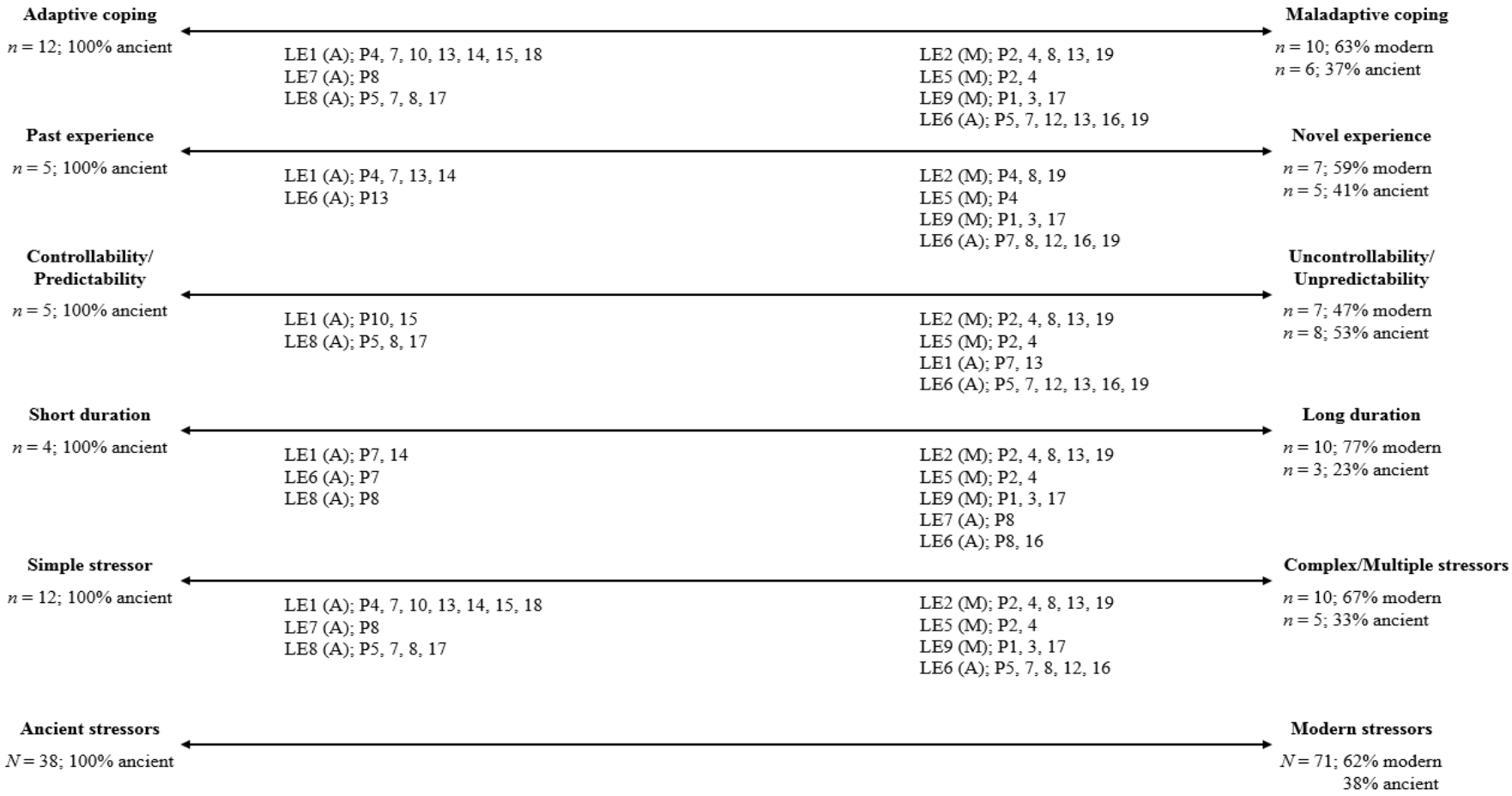

Figure 5.4. Diagram illustrating the frequencies in percentages (%) of ancient and modern life event stressors that fall along the line of each psychological characteristics' category.

n/*N*: number of quotes; LE: life event (e.g., LE1: life event no 1 from table 5.1); A/M: ancient or modern (as designated from Schreier and Evans, 2003); P: participant (e.g., P4: participant no 4)

Ancient stressors	7 Extremely stressful	6	5	4 Moderately stressful	3	2	1 Not at all stressful	2	3	4 Moderately stressful	5	6	7 Extremely stressful	**Modern stressors**
		LE1P10	LE1P4	LE6P7	LE1P15						LE2P2	LE2P4	LE2P8	
		LE1P14	LE1P7	LE6P8	LE6P5						LE5P2	LE2P13	LE2P19	
		LE1P18	LE1P13	LE8P8	LE6P12						LE9P1	LE5P4	LE9P17	
			LE7P8		LE6P13							LE9P3		
			LE8P17		LE6P16									
					LE6P19									
					LE8P5									
					LE8P7									

Figure 5.5. Diagram showing the severity of ancient and modern life event stressors as experienced by younger adults. This severity ancient/modern stressors Likert scale illustrates how stressful each life event was for each interviewed participant. For example, LE2P8 indicates that participant no 8 found the life event (no 2) of unemployment, which has been designated as modern stressor, extremely stressful.

Ancient stressors: Bereavement/death (LE1); Movement (LE6); Health/illness of others (LE7); Social/interpersonal arguments (LE8)

Modern stressors: Unemployment (LE2); Health/illness of self (LE5); Separation/distance (LE9)

5.5.4.1 Younger adults' gender differences in coping and SCEs regarding ancient and modern stressors

Qualitative analysis showed that male and female younger adults dealt with ancient stressors in a similar way. Thus, no gender differences were identified. Both male and female younger adults were able to deal with the matched ancient life event stressors using problem, emotion-focused and meaning-based coping strategies (i.e. adaptive coping); for example, planning, active coping, seeking instrumental and emotional social support, mental disengagement/self-distraction, acceptance or denial of the stressor, positive reappraisal, activating spiritual beliefs and experiences, focusing on and venting of emotions, revising goals and planning goal-directed problem-focused coping. Regarding modern stressors, any form of adaptive coping was not identified as expected; supportive evidence can be found in section 4.4.4 (in chapter four), in tables 5.6, 5.7 and 5.8, and in appendix D.

Interviewed younger adult participants also revealed their experiences about SCEs in relation to ancient and modern stressors. SCEs have been reported by both males and females mainly in ancient stressors. The most prevalent SCE in both male and female younger adults was shame associated with guilt and self-blame (Table 5.9).

Table 5.9

Sample of SCE quotes in ancient and modern life event stressors

Quotes	Life event	SCEs
I felt a bit guilty that I didn't see him more often… and ashamed… because I didn't make it to the funeral. I'm feeling embarrassed.	Death/bereavement	Guilt/ Shame
… then I blame my parents for not letting me know earlier…	Death/bereavement	Externalisation
I definitely blamed myself. As I said, I underestimated it completely. I needed to take the responsibility of my actions… it was a shame towards my father that I didn't take his advice.	Movement	Self-blame/ Shame
I felt guilty, ashamed and I blamed him, it's kind of externalisation of emotions. I also felt detached from him even more …. I also blamed myself a bit.	Social/interpersonal arguments	Guilt/ Shame/ Externalisation/ Detachment/ Self-blame
Maybe I was blaming her because I thought that she was overreacting.	Social/interpersonal arguments	Externalisation
I fail at something and my father whose approval I so much seek would never come …. I felt definitely ashamed of myself.	Unemployment	Self-blame/ Shame
The blame is on me I guess because everyone was saying that.	Unemployment	Self-blame/ Shame

5.6 Discussion: quantitative and qualitative CA findings

This section will interpret and discuss the quantitative and qualitative findings in relation to younger adults' appraisal of ancient and modern stressors, and will link these findings with the wider literature although it is limited. A more critical and narrow-focused stance will be taken in order to discuss the feasibility of provisionally distinguishing between ancient and modern stressors based on psychological characteristics.

5.6.1 The association of ancient and modern stressors with SCEs

In accordance with hypothesis 1, quantitative findings showed a moderate negative association between shame and the total number of ancient life event stressors, and a weak negative association between shame and the total number of modern stressors. Taking a step further from the indicative correlation analyses, in contrast to hypothesis 1a quantitative findings indicated shame was best and significantly predicted by the total number of ancient stressors and gender. This implies that individuals who experienced fewer ancient life event stressors reported higher levels of shame proneness and that females were more likely to express shame than males in stressful situations.

According to the transactional theory of stress and coping, theories of adaptation and SCEs (Lazarus & Folkman, 1984b; Sterling & Eyer, 1988; Tangney & Dearing, 2003), those who are more able to adapt and deal with ancient stressors, are more prone to report shame. SCEs (e.g., shame) may have been experienced if acute psychosocial, or social-evaluative, stressors have been appraised as important to individuals' actions, behaviour and self-evaluation (Bulger, 2013; Dickerson, 2008; Lewis & Ramsay, 2002; Reisenzein & Hofmann, 1990; Roseman, 1991; Roseman et al., 1990; Siemer et al., 2007; Weiner et al., 1982). SCEs have not been inherited but have had an evolutionary

adaptive implication for human beings and can be described regarding the secondary cognitive appraisal, whereby coping processes are directed towards the self (Cosmides & Tooby, 2000; Lazarus, 1991; Lewis, 2011). People appraise a stressor if it is relevant or incongruent (expressing shame and guilt) to themselves and either ascribe the cause of the stressor to themselves (expressing self-blame) or to others (externalisation of blame) (Tracy & Robins, 2004). Previous research has also shown that acute psychosocial stressors are associated with SCEs experience and HPA axis activation (Dickerson & Kemeny, 2004; Gruenewald et al., 2007; Kirschbaum et al., 1993; Miller et al., 2007).

Lewis (2011) claimed that shame is the emotion-outcome of individuals' appraisal of stressful, internal, stable and uncontrollable events, and guilt is the outcome of internal, unstable, controllable and specific events. D'Argembeau and Van der Linden (2008) also argued that shame is associated with negative life events which afterwards leads to internalisation of blame (Webb, Heisler, Call, Chickering, & Colburn, 2007); self-blame was also reported along with shame in ancient stressors in the present study. One of the most important points to interpret the association between ancient stressors and shame has been made by Tracy and Robins (2006); from an evolutionary perspective, shame is elicited when individuals cannot take control over events that they were supposed to be able to adapt, control and change (Orth, Berking, & Burkhardt, 2006). Younger adults, who were supposed to be able to adapt, control, predict and deal with ancient stressors, were more likely to report negative SCEs (Siemer et al., 2007) and specifically shame (Zautra, 2006).

This study also examined whether the severity of ancient and modern stressors would be associated with negative SCEs. Previous research argues that the severity of stressful life events reflects better the impact of those stressors on people's health and

illness outcomes (Holmes & Rahe, 1967; Kacel et al., 2014; Kendler et al., 2001; Rahe et al., 1970; Roca et al., 2013). The present study did not find any significant associations between the severity of ancient and modern stressors with SCEs (hypothesis 1b); a potential reason might have been that no measure yet exists of ancient and modern stressors per se.

The present study explored if gender would moderate the relationship between ancient and modern stressors and shame. In contrast to hypothesis 2, no moderation effects were found because of no associations between the stressors and the mediator; this implies that this relationship does not depend on the value of gender showing a direct effect. Gender has been examined in stress research as a moderator (Geisner et al., 2004; Israel-Cohen & Kaplan, 2016; Wohlgemuth & Betz, 1991), although it has not been extensively assessed as a moderator in the stress and emotions relationship. Moksnes et al. (2010) tested gender as a moderator of the stress and emotions relationship in adolescents; no significant results were found which support this finding. However, future studies could explore gender as mediator in relation to ancient and modern stressors in a different population. Although, this study found that ancient and modern stressor could not be distinguished by their SCE profile, future studies would benefit from exploring associations between ancient and modern stressors with particularly shame and guilt as well as with cold symptoms, as such it has been suggested by Schreier and Evans (2003).

5.6.2 Discussion of the CA findings in younger adults

The main aim of this study was to explore psychological characteristics (criteria) that would enable the feasibility of provisionally distinguishing between ancient and modern stressors. The deductive CA identified common psychological characteristics

which were found to underlie ancient and modern stressors. The qualitative analysis dealt only with those life event stressors that were a priori designated as ancient and modern from Schreier and Evans (2003) providing some empirical basis and a defensible justification to provisionally distinguish between ancient and modern stressors. The characteristics for ancient stressors were: adaptive coping, past experience, controllability/predictability, short duration and simple type of stressor. The characteristics for modern stressors were: maladaptive coping, novelty, uncontrollability/unpredictability, long duration, and complex and multiple stressors. These characteristics should not be considered as conclusive for either ancient or modern stressors, although the CA showed that specific stressors were considered from younger adults as more ancient or more modern across the continuum according to these characteristics.

Based on an evolutionary perspective, people are better able to adapt and cope with stressors which have been around for many years (i.e. ancient stressors) than more recent (modern) stressors (Schreier & Evans, 2003). The fight-flight response was suitable for dealing with a palaeolithic (ancient) stressor; this stress response enabled the ancestors to battle the predator or run away from it (Sapolsky, 1994). However, the fight-flight response might not be appropriate to more modern stressors because stressors have become more complex and might need a greater level of cognitive appraisals in relation to the transactional theory so that individuals to adapt and cope. Additionally, modern people might not have been well-equipped with adaptive coping mechanisms to deal with modern stressors (Dienstbier, 1989).

Starvation, infection, dehydration, violence and climate have been considered as ancient stressors because they require individuals' adaptation and coping (i.e. allostasis) in order to survive (Korte et al., 2005). Martin et al. (2017) also argued that people are

evolutionary capable of adapting their behaviour and coping through hypo-egoic strategies to situations that the palaeolithic ancestors used to deal with (Leary et al., 2006). This argument accords with the notion that there are established psychophysiological coping processes which enable people to deal with ancient stressors, as these stressors have been an integral part of human evolutionary history (Schreier & Evans, 2003).

Modern psychological stressors (e.g., work issues, domestic violence, natural catastrophes) last for an extended period (Cheung & Li, 2012), and this might be one of the reasons why individuals are less able to adapt and deal with resulting in wear and tear of the body (McEwen & Stellar, 1993; Sterling & Eyer, 1988). This study identified duration as a psychological characteristic to distinguish between ancient and modern stressors. Stressful life events, which are unpredictable, uncontrollable, uncertain and unfamiliar, may cause additional strain to people because of insufficient coping resources (Michie, 2002) leading to negative health outcomes (Izzo et al., 2005). Controllability and predictability was another characteristic that was found to underlie the stressors. However, individuals' ability to respond quickly to stressors might have a greater adaptive significance than the ability to control the stressor (Anisman & Merali, 1999).

Acute, unpredictable, unfamiliar and uncertain (Mason, 1968), uncontrollable (Henry & Grim, 1990; Sapolsky, 1994), novel (Rose, 1980), and prolonged stressors (i.e. modern stressors) that are associated with other stressors (i.e. complexity and multiplicity) are more likely to lead people to inability to adapt and cope (i.e. maladaptive coping) (Anisman, Zalcman, Shanks, & Zacharko, 1991; Sklar & Anisman, 1981), neurochemical and behavioural problems, and increased cortisol responses (Dickerson & Kemeny, 2004). This previous research provides evidence and a

reasonable explanation why maladaptive coping, unpredictability/uncontrollability, novel experience, long duration and complexity/multiplicity constitute psychological characteristics of modern stressors. The psychological characteristics that were found to underlie modern stressors appear to fit with the term "stress mosaic" (Michaud, Matheson, Kelly, & Anisman, 2008, p. 190), which was used to show the complexity of stressors.

Modern stressors were also found to be characterised by multiplicity and complexity, as people might need more time to adapt and cope with challenging stressors that have not previously been experienced (i.e. novelty) or mismatch with the familiar ancient past (Li & Kanazawa, 2016; Tooby & Cosmides, 1990). According to anthropological and evolutionary medicine, there is also a mismatch between ancestors who can adapt to ancient situations and non-industrial societies, which are more similar to the ancestral environments (Flinn et al., 2011; Schreier & Evans, 2003), and the more modern life situations; this incompatibility can lead to negative health outcomes (Eaton et al., 2002; Trevathan, 2007; Williams & Nesse, 1991). According to evolutionary neuroscience, it might be more feasible for individuals to cope with ancient rather than modern stressors due to the reptilian and paleomammalian brain complexes of coping, which is unconscious and automatic (MacLean, 1990). The brain activates coping enabling individuals to survive from threats (i.e. fight-flight response) and adapt through allostasis to life changes, challenges and mismatches with novel situations (Flinn et al., 2011; Laurent, Lucas, Pierce, Goetz, & Granger, 2016; MacLean, 1990). However, even daily but probably novel stressors that occur in modern naturalistic environments might lead people to maladaptive responses (Flinn et al., 2011).

Although previous research in psychology is limited especially about ancient and modern stressors, research on several evolutionary sciences provided some

evidence to support the psychological characteristics in order to provisionally distinguish between ancient and modern stressors. Younger adults are likely to be able to adapt and deal with ancient stressors through adaptive coping as these stressors are similar to ancestral environments with which ancestors were well-equipped to deal. For more modern stressors, which have been characterised as uncontrollable, unpredictable, complex and novel, it appears to be a mismatch between individuals' coping abilities and maladaptive responses. This was the first study to explore the distinction between ancient and modern stressors in relation to psychological characteristics.

5.6.3 Gender differences in coping and SCEs in relation to ancient and modern stressors

In this second part of study one, the qualitative CA dealt with those life event stressors that were a priori designated as ancient and modern from Schreier and Evans (2003) and have been explored in the first part of study one in chapter four. This was the first study to explore gender differences in younger adults' coping and SCE experiences in relation to ancient and modern stressors. As has been already presented and discussed, the present study did not find any gender differences in coping with ancient and modern stressors. This finding has been in line with Schreier and Evans (2003) finding that boys and girls did not differ in the experience of ancient and modern stressors. In this study, both male and female younger adults dealt with ancient life event stressors through problem-focused, emotion-focused and meaning-based coping strategies (sections 5.5.4; 5.5.4.1). Regarding modern stressors, both males and females did not indicate any form of coping (i.e. maladaptive coping) and this might be because of the nature and psychological characteristics of modern stressors. These findings are also congruent with the notion recommended by Schreier and Evans (2003) that there

are established psychophysiological coping processes that enable people to adapt and deal with ancient rather than modern stressors.

Regarding gender differences in the SCE experiences in relation to ancient and modern stressors, the findings suggested that SCEs were reported by both male and female younger adults mainly regarding ancient stressors (also see section 4.5.2 in chapter four; and 5.5.4.1). The interpretation of these findings cannot be regarded as conclusive, although previous limited research supports that both genders are likely to report shame, guilt, externalisation of blame and self-blame in stressful situations (Bulger, 2013; Efthim et al., 2001; Lewis & Ramsay, 1997; Pivetti et al., 2016; Siemer et al., 2007). However, it could be concluded that ancient and modern stressors are not distinguishable be their SCE adaptive profile.

5.7 Overall discussion for both parts of study one

This section aims to integrate and sum up the most important quantitative and qualitative findings of study one. The main aim of the first part of the present study (chapter four) was to explore which psychosocial factors younger adults found stressful and why, and whether these reasons could provide evidence to categorise stressors as ancient and modern. Significant associations were found between the psychosocial factors and SCEs, which were supported by theory and previous evidence-based studies. The inductive TA presented six higher-order themes: health and well-being, personal interactions and the self, career and occupation, news events, physical activity involvement, and financial and legal issues. Gender differences were subsequently explored in coping with psychosocial stressors and SCE experiences; both male and female younger adults were likely to be able to deal with and report SCEs in some life event stressors (Matud, 2004; Tamres et al., 2002). However, the TA did not provide

sufficient evidence and a plausible rationale to categorise psychosocial stressors as ancient and modern in relation to adaptation and coping.

This is why a different analytical approach was employed (i.e. deductive CA) in the second part of study one in order to explore what the necessary criteria were to make a provisional distinction of psychosocial stressors as ancient and modern. In order to address and explore this aim, the life event items that were used from the LEI in this study were matched with the most similar life event items from the original article of Schreier and Evans (2003), which had been a priori designated as ancient and modern. Although this decision led to a reduction in the number of life events, it could provide a defensible and plausible justification to provisionally distinguish between the stressors.

Quantitative findings indicated that ancient life event stressors and gender could predict shame suggesting that there might be indeed a distinction between ancient and modern stressors in relation to SCEs. In order to explore in greater depth a provisional distinction, the CA identified five psychological characteristics that were found to underlie ancient and modern stressors, namely; coping, experience, manageability/expectedness, duration, and type of stressor. Specifically, the characteristics for ancient stressors were: adaptive coping, past experience, controllability/predictability, short duration, and simple specific stressor. The characteristics for modern stressors were: maladaptive coping, novel experience, uncontrollability/unpredictability, long duration, and complex and multiple stressors. As it has been predicted and according to Schreier and Evans (2003), younger adults, both males and females, were likely to be more able to adapt and deal with ancient rather than modern stressors, as the former have been an integral part of the human evolutionary history and more familiar with individuals' ancestral past. Also, in accordance with the quantitative finding, SCEs (i.e. shame, guilt, self-blame) were

found to underlie more the ancient than modern stressors and higher levels were reported from women than men based on the quantitative findings (Efthim et al., 2001; Else-Quest et al., 2012; Lewis, 1995; Lewis & Ramsay, 2002; Pivetti et al., 2016). However, this finding does not provide sufficient evidence to suggest that the stressors can be distinguished by their SCE profile.

The main aim of study one was to explore the feasibility of provisionally distinguishing between ancient and modern stressors in a younger adult population. Although past research is very limited regarding ancient and modern stressors and SCEs, this aim was addressed and explored and the contribution of this study in the broader stress research is important. The present study not only investigated in greater depth and verified the a priori ancient and modern stressors designation from Schreier and Evans (2003), but also strengthened this provisional distinction from a psychological perspective identifying psychological characteristics.

These psychological characteristics cannot be regarded as conclusive for ancient and modern stressors yet. However, this study suggests that a stressor can be considered as more ancient or more modern across the continuum depending upon its own characteristics and individuals' appraisal. Study one also supports the notion from Schreier and Evans (2003) that there might have been established psycho-physiological coping processes (i.e. adaptive coping) which enable people to deal with ancient stressors; and suggests that the life event stressors of death/bereavement, health of others and social/interpersonal arguments could be considered as ancient. It also suggests that the life event stressors of unemployment, health of self and separation/distance could be regarded as more modern. Further to this, younger adults reported and experienced modern stressors as more stressful than ancient stressors. This implies that modern stressors because of their characteristics might have a greater

impact on physical health rather than ancient stressors. Lastly, study one interestingly indicated that the life event stressor of movement, which had been a priori designated as ancient, was mainly described by more modern characteristics.

The next study will aim to assess stress appraisal and experiences of older adults and explore evidence of underlying psychological characteristics in order to feasibly distinguish between ancient and modern life event stressors through a mixed-methods approach. This work enabled to confirm the psychological characteristics and define specific psychosocial stressors as ancient and modern, as well as to draw conclusions about the stressors' distinction across adulthood (e.g., potential age differences between younger and older adults). Study two will also explore associations between ancient and modern stressors with common cold symptoms and SCEs (i.e. shame and guilt) in an older adult population. The application of psychological characteristics in ancient and modern stressors will strengthen and validate this provisional designation.

5.7.1 Strengths and limitations of study one

As the first study to investigate stress in the form of negative life events and hassles, ancient and modern stressors and SCEs in younger adults, this study has many strengths regarding novelty and discussion of the findings. A thorough sequential explanatory design resulting in a mixed-methods approach was employed using a series of self-report questionnaires and semi-structured interviews to i) explain what psychosocial factors younger adults found stressful and why; ii) to attempt to categorise these factors as ancient and modern stressors in relation to adaptation and coping; iii) to explore the feasibility of provisionally distinguishing between ancient and modern stressors regarding psychological characteristics utilising an a priori stressors' designation; and iv) to investigate any gender differences in coping and SCEs regarding

ancient and modern stressors. The aforementioned concepts have not been examined before in relation to ancient and modern stressors through interviews. This study also benefitted from the large and sufficient sample size of 100 younger adults recruited to complete the questionnaires and 20 participants interviewed, which created a wealth of rich quantitative and qualitative data. The major strength of this study was the exploration of psychological characteristics that enabled to provisionally distinguish between ancient and modern stressors.

However, weaknesses of this study should be considered. Regarding the practical nature of study one, participants were recruited entirely from the University, resulting in a relatively homogeneous sample. Future research would benefit from recruiting adults across the country from several and different social and work backgrounds in order to explore in greater depth and extent younger adults' perceptions of stressors (Jackson et al., 1991; Quarterman, 2008). Secondly, the participants, who took part in the interview phase, had been re-contacted approximately four weeks after the completion of the questionnaires and were not interviewed until two weeks later. This six-week delay meant a few participants needed more time to remind themselves about the questionnaire responses, and to recall past memories and experiences. Thirdly, although the use of semi-structured interviews was an appropriate method to address and explore the research question (Miles & Gilbert, 2005), the long duration of the interviews might have caused fatigue to some participants because a lot of topics were covered in depth. Fourthly, a few younger adults, who consented to participate in the interviews, were not eager to share and discuss openly their experiences.

With regard to interpretation of the findings, the use of SCEs for reasons that have been already discussed did not provide sufficient evidence to distinguish between the stressors. However, future research would benefit from exploring the appraisal of

emotions in relation to ancient and modern stressors (Lazarus & Folkman, 1984b), as this study explored specific life event stressors and an even more specific class of emotions. Any interpretations of the ancient and modern stressors distinction would be beneficial to be made regarding younger adults until further research takes place with other adult groups.

Additionally, the psychological characteristics that were found to underlie ancient and modern stressors could not be considered as conclusive at this point of research. Although there has been some initial evidence to distinguish between the stressors, there has also been some variation between the stressor categories and within each stressor in relation to characteristics. However, this study accords with Schreier and Evans (2003) finding on children suggesting that younger adults were more able to deal with ancient than modern stressors; thus, regardless of age, there might have been established coping mechanisms that enable individuals to innately adapt and deal with familiar ancient stressors. Nonetheless, future research might provide a more holistic understanding and clearer view of the characteristics and life events that belong to ancient or modern stressors.

Regarding limitations in methodology, this study could not assess bio-physiological measurements of individuals, as Schreier and Evans (2003) examined urinary cortisol in ancient and modern stressors. According to the theory of allostasis (Sterling & Eyer, 1988), it would be expected that modern stressors would be positively associated with higher HPA axis activity in younger adults, resulting in wear and tear of bodily systems and poorer health implications (Schreier & Evans, 2003).

Another weakness of the present study was the alteration from the inductive and to the deductive qualitative approach and analysis. Although an individual might have seen this as a strength in terms of the concept under exploration, this alteration led to a

reduction in the life event stressors that were examined. In the first part of this study, a wide range of life events and hassles were explored, whereas in the second part since this decision was made only a few life events were investigated. However, this decision enabled firstly a more in depth exploration of specific life event stressors; secondly dealing with evidence-based a priori designated stressors; and thirdly an unbiased approach, analysis and interpretation of findings from the researcher that was not dependent on the previous adaptation and coping analysis.

Currently, there is not any measure to assess specifically ancient and modern stressors. Future research would benefit from the construction of an ancient and modern stressors' psychological measure in order not only to replicate this study, but also to provide a standardised, reliable and valid measure to the wider research community. Despite this lack of a specific measure, the psychological scales used in this study served their purposes and the aim of study one. As there is only one published article on ancient and modern stressors, interpretation of the findings needs to be based on the available and existing literature. This study has provided some initial basis and evidence in stress research in order to further explore the novel and innovative concept of ancient and modern stressors.

5.7.2 Conclusions of study one

The present study considered younger adults' appraisals and experiences of psychosocial stressors, in the form of negative life events and hassles; SCEs reported; and coping mechanisms regarding ancient and modern stressors. Psychosocial stressors were found to be significantly associated with SCEs, such as shame and guilt. Support of these findings was found in the wider stress, emotions and coping literature. No gender differences were found in coping and SCEs, which were supported by previous

research and suggest homogeneity in sampled younger adults' perceptions of stressors. Qualitative analyses explored and investigated in depth younger adults' appraisal and experiences of psychosocial stressors and SCEs. This naturalistic mixed-methods study identified psychological characteristics in ancient and modern stressors, which provided some initial evidence to provisionally distinguish between the stressors. Future studies should aim to explore, strengthen and validate the ancient and modern stressors distinction in relation to psychological characteristics in a different population. This would enable and ensure a distinct classification of stressors that could be usefully applied in a health context, as this would be the first study to explore ancient and modern stressors and physical health. Study two aims to explore the feasibility of distinguishing between ancient and modern stressors in an older adult population regarding psychological characteristics and considering older adults' stress appraisal and stress experiences. Study two will not only strengthen and validate the ancient/modern stressor distinction, but will also explore associations between these stressors and physical health.

Chapter Six: Study Two

An exploration of the ancient and modern stressor distinction in older adults

6.1 Chapter overview

This chapter follows up the main findings from the previous two chapters and it introduces and explores ancient and modern stressors in an older adult population through a mixed-methods study. It links ancient and modern stressors with common cold symptoms and examines the role of gender in stress research in older adults. Having found in study one psychological characteristics that underlie ancient and modern stressors, study two extends and develops this exploring older adults' stress appraisal and experiences of psychological characteristics in order to assess the feasibility of distinguishing between ancient and modern stressors within a health context. Multiple regressions found that shame was best predicted by modern stressors and gender, guilt by ancient stressors, and common cold symptoms were best predicted by modern stressors. Content analysis verified the stressor psychological characteristics that were found in the second part of study one. This might imply that ancient and modern stressors could be distinguished in older adults, and that modern stressors might have a greater influence on cold symptoms than ancient stressors.

Although study two uses the same methodology of study one (i.e. phase one: questionnaires; phase two: interviews) but in a different adult population, the findings of study two are presented in just one chapter and not in two chapters as with study one. The reason why a different chapter structure has been used in study two is because the analysis of study two focused from the beginning on the specific matched ancient and modern life event stressors and not on the whole pool of life event and hassle stressors that were examined in part one of study one. This enabled not only to explore the

feasibility of provisionally distinguishing between ancient and modern stressors in a health context, but also to assess and confirm the psychological characteristics that were identified in study one as well as to provide a plausible and justifiable rationale for an ancient/modern stressor distinction in older adults based on the a priori evidence-based stressor designation by Schreier and Evans (2003).

6.2 Introduction

6.2.1 Stressful psychosocial factors and coping in older adults

The first study explored the feasibility of provisionally distinguishing between ancient and modern stressors and associations between this stressor distinction and self-conscious emotions (SCEs) in younger adults. Quantitative analysis found that ancient stressors and gender were significant predictors of shame. Qualitative analysis identified five underlying psychological characteristics that were differentially associated with ancient and modern stressors: coping, experience, manageability/expectedness, duration, and type of stressor. The characteristics for ancient stressors were: adaptive coping, past experience, controllability/predictability, short duration and simple type of stressor; and for modern stressors: maladaptive coping, novel experience, uncontrollability/unpredictability, long duration, complex and multiple type of stressor. Study two will build upon this exploring ancient and modern stressor characteristics in older adults' experiences. The aim of doing this is not only to strengthen the provisional distinction between ancient and modern stressors, but also to draw conclusions about these stressors across adulthood. Considering the findings of study one, the current study will also investigate any potential moderating effects of gender, shame and guilt on the relationship between ancient and modern stressors with cold symptoms. Study

two builds upon the previous study in order to further explore the validity of the ancient and modern stressors distinction.

Previous chapters have discussed in depth theories and past research regarding life event stressors, coping, SCEs, physical health; the role of gender in stress research (Cohen & Hoberman, 1983; DeLongis et al., 1982; Folkman, 1997; Kanner et al., 1981; Lazarus & Folkman, 1984b); and ancient and modern stressors (McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling & Eyer, 1988). This introduction will focus on critically presenting these concepts in relation to the second study: the literature and research around ancient and modern stressors in an older adult population.

Regarding stressful psychosocial factors, a wide range of life events happen in the everyday life of older adults with the most prevalent related with health and illness issues, death and bereavement of a close family member/friend, retirement, family arguments and financial concerns (Hardy, Concato, & Gill, 2002; Moos, Brennan, Schutte, & Moos, 2006; Murrel, Norris, & Hutchins, 1984; Norris & Murrell). Findings from study one and research by Schreier and Evans (2003) have provisionally designated some of these stressors as ancient and modern.

6.2.1.1 Total number and severity of stressful life events

As with study one, the total number and severity of life event stressors will be also considered for the purposes and analysis of this study. A meta-analysis from Kraaij, Arensman, and Spinhoven (2002) showed that the total number and severity of life event stressors have been associated with depression and anxiety in older adults (Hermans & Evenhuis, 2012; Roca et al., 2013; Tennant, 2002); physical and mental health (de Frias & Whyne, 2015); well-being (de Paula Couto, Koller, & Novo, 2011; Kahana, Kelley-Moore, & Kahana, 2012; Mancini, Bonanno, & Clark, 2011); increased

salivary cortisol levels (Epel, 2009); and with a negative effect on adherence to medication (Holt et al., 2012). Chapters four and five, and also these studies provide a rationale for study two to examine the total number and severity of ancient and modern stressors in relation to SCEs and cold symptoms in older adults.

6.2.1.2 Age differences in stressful life events

Several studies have shown that older adults report fewer experiences of life events (e.g., health, social, work, financial-related issues) than younger adults (Aldwin, 1990, 1991; Folkman, Lazarus, Pimley, & Novacek, 1987; Goldberg & Comstock, 1980; Masuda & Holmes, 1978; Paykel, 1983). Cohen (1990) described two reasons why older adults may report fewer stressors: i) older adults might be unwilling to associate psychological symptoms with stressors' experience; ii) they might have appraised life events as less stressful compared to younger adults due to their lifetime experience and acquired coping strategies (Aldwin, Sutton, Chiara, & Spiro, 1996). According to previous studies and the findings of study one, it is expected that older adults would be more able to cope with ancient stressors due to established coping processes and previous experience. However, they might be less able to deal with more modern stressors because of the nature and characteristics that underlie these stressors.

6.2.1.3 Older adults' coping with life event stressors

Older adults are able to cope with life events related to health and illness, death and bereavement of close family members/friends, and their own mortality (Aldwin et al., 1996). Previous research has shown that they apply problem-focused coping in controllable life events (e.g., work-related problems) and cognitive avoidance coping in

less controllable events (e.g., health-related problems) compared to younger adults (Felton, 1990; Mattlin, Wethington, & Kessler, 1990; O'Brien & DeLongis, 1996; Patterson et al., 1990). For example, a sample of 98 female adults, aged 61 years, were found to be more likely to employ problem-focused coping into health issues and emotion-focused coping (emotional disengagement) in personal problems than males (Moos et al., 2006). Similarly, Lee and Mason (2014) stated that adults, aged 65 years and over, are likely to employ problem-focused, emotion-focused and avoidant coping. They also argued that older women make greater use of planning, active coping, internalised coping (i.e. self-blame, escape-avoidance), positive reappraisal (Berg & Upchurch, 2007), turning to religion (Koenig, George, & Siegler, 1988), denial and emotional social support, whereas older men are likely to use instrumental social support, substance use and externalised coping (i.e. blame of others) (Diehl, Coyle, & Labouvie-Vief, 1996; Lee & Mason, 2014).

A recent systematic literature review indicated that older adults, compared to younger adults, are more likely to use the meaning-based coping of positive reappraisal to deal with stressors (e.g., bereavement) which result in improved health and emotion regulation (Nowlan, Wuthrich, & Rapee, 2015). Older adults, specifically older women than men, benefit from positive reappraisal regarding health problems as this strategy does not focus on changing the stressors but altering the appraisal of stressor. Positive reappraisal enable older adults to deal with physical health and bereavement. Older adults appear to employ this coping strategy due to their maturation and lifetime experiences as it requires less cognitive processes than other strategies, and enables a positive bias which focuses on positive event or emotion outcomes according to the transactional model (Nowlan et al., 2015).

Interestingly, a study by Perry, Ruggiano, Shtompel, and Hassevoort (2015) applying Erikson's theory of human developmental stages showed that adults, aged 65 and older, are likely to apply problem-solving coping and past experience to health-related issues that arise later in their life. Life experience associated with ageing may also require older adults to be more adaptive in stressful situations that are not under their control (Diehl et al., 1996). However, several studies contradict this argument claiming that older adults employ less effective coping than younger adults because they lack perceived controllability and adaptability to stressful situations because of ageing (Aldwin, 1991; Meeks, Carstensen, Tamsky, Wright, & Pellegrini, 1989). Older adults may use more passive and emotion-focused coping (e.g., self-disengagement, suppression of emotions, positive reappraisal) in stressful situations (Berg & Upchurch, 2007), whereas younger adults may often use active and problem-focused coping (Folkman et al., 1987).

To elaborate these contradictory arguments, a developmental explanation about age differences suggests that people become less able to cope as they age (Meléndez, Mayordomo, Sancho, & Tomás, 2012); and a contextual explanation about gender differences suggests that men and women cope differently because they follow different life paths resulting in different experiences (Folkman et al., 1987). Despite this, previous research on age and gender differences has shown that adults do not significantly differ in coping strategies (Aldwin, 1991; Matud, 2004; Tamres et al., 2002).

To sum, age and older adults, as a population, are particularly important when considering stress and coping. Although there has been no research in particular about ancient and modern stressors in older adults, psychosocial stressors associated with older adults (e.g., health and illness, death and bereavement of a close friend/family

member) have been provisionally designated as ancient and modern in study one. Study two will assess older adults' appraisal and experience of psychosocial life events in order to further explore and verify the provisional distinction of ancient and modern stressors. Considering previous research and study one's findings, it is expected that older adults (aged over 60 years) compared to younger adults (18-24 years) will be more able to deal with ancient rather than more modern stressors due to past experience, controllability, adaptation and acquired coping mechanisms. Additionally, it is not expected that older men and women will differ in coping with ancient and modern stressors.

6.2.2 The experience of shame and guilt in older adults

As discussed in previous chapters, the appraisal theory of emotions suggests that the perception of psychosocial stressors can result in the experience of negative emotions, such as the SCEs of shame and guilt (Glanz et al., 1990; Reeve, 2009; Siemer et al., 2007; Tangney & Dearing, 2003). Previous studies showed that shame was associated with disclosure of illness (e.g., HIV/AIDS) in older adults (Emlet, 2006); anxiety, health literacy and mortality ; and psychopathology (i.e. depression and anxiety) in older psychiatric patients (Crossley & Rockett, 2005).

Experience of guilt and shame in older adults was also associated with specific life events, such as health problems, being dependent to receive health care by others, being unable to take care of themselves and do everyday tasks they used to do, causing inconvenience to close family members, and bereavement (Cahill, Lewis, Barg, & Bogner, 2009; Lund, Caserta, & Dimond, 1986; Lyberg, Holm, Lassenius, Berggren, & Severinsson, 2013). Additionally, shame and guilt were associated with acute social-evaluative and chronic psychosocial stressors resulting in greater HPA axis activation

and cortisol release, if those life event stressors were considered as important to one's self-evaluation and incongruent to personal goals (Dickerson, 2008; Dickerson, Gruenewald, et al., 2004; Dickerson & Kemeny, 2004; Dickerson, Kemeny, et al., 2004; Dickerson et al., 2008; Gruenewald et al., 2007; Lewis & Ramsay, 2002; Miller et al., 2007; Reisenzein & Hofmann, 1990; Roseman, 1991; Roseman et al., 1990; Siemer et al., 2007).

Orth, Robins, and Soto (2010) argued that shame and guilt are increasing from adolescence to older adulthood, and that as individuals age they are more prone to report adaptive SCEs (guilt) and less prone to report maladaptive SCEs (shame) in psychological well-being and social relationships due to their personality development. Older adults often experience guilt in situations of physical inactivity and shame in circumstances facing physical health problems, and not being autonomous and independent (Erikson & Erikson, 1998). Women also express greater shame and guilt than men (Orth et al., 2010; Roberts & Goldenberg, 2007; Tangney & Dearing, 2003). Other studies have found that older adults, compared to younger adults, are likely to report and experience fewer negative emotions in life event stressors due to their experience in managing and regulating negative emotions (Carstensen, Pasupathi, Mayr, & Nesselroade, 2000; Gross et al., 1997; Henry, von Hippel, Nangle, & Waters, 2018; Labouvie-Vief, Hakim-Larson, & Hobart, 1987; Lawton, Kleban, & Dean, 1993; Tangney, Wagner, et al., 1996). Also, a meta-analysis found that age did not moderate the relationship between gender and shame and guilt (Else-Quest et al., 2012).

Shame and guilt have also been assessed as moderators in previous research; this study will examine whether shame and guilt moderate the relationship between ancient and modern stressors with physical health outcomes. Shame has acted as moderator in the relationship between family dysfunction and bulimia (Murray, Waller, & Legg,

2000); chronic procrastination and perfectionism (Fee & Tangney, 2000); shame traumatic memories and depression (Matos & Pinto-Gouveia, 2010); and child psychological maltreatment, anger and depression in adults (Harper & Arias, 2004). Guilt has been examined as moderator in the leisure activities and depression relationship (Romero-Moreno et al., 2013).

The ancient and modern stressors distinction has been considered only in children (Schreier & Evans, 2003) and in younger adults in study one; it has not been considered in an older adult population before. This study examines the association between ancient and modern stressors with shame and guilt and is the first to do this in an older adult population. In addition, it explores older adults' gender differences in shame and guilt about ancient and modern stressors. It is expected that older adults will experience less shame and guilt about ancient stressors due to their greater ability to regulate negative emotions, and greater shame and guilt about modern stressors because of being less able to adapt and cope with these stressors which might be incongruent with older adults' personal goals and self-evaluation. Also, older females are more likely to express shame and guilt across both categories of stressors rather than males.

6.2.3 The experience of physical health symptoms in older adults

Inability to adapt to negative life event stressors results in increased physiological arousal, negative emotions, unsuccessful prolonged stress responses and negative physical health implications (e.g., allostatic load) (Danner et al., 2001; Dickerson, 2008; Dickerson et al., 2009; McEwen, 1998b; Sterling & Eyer, 1988). Despite this, the research about emotions' appraisal and physical health in older adults has been non-existent in relation to ancient and modern stressors.

Leventhal, Patrick-Miller, Leventhal, and Burns (1998) claimed that the inability of older adult populations to regulate negative emotions may lead to prolonged physiological activation, maladaptive and detrimental health issues (Gross et al., 1997), increased wear and tear of physiological allostatic systems and decreased ability to cope. Glei et al. (2007) using biomarkers (e.g., BMI, blood pressure, (nor)adrenaline, dopamine, cortisol, insulin, cholesterol, glucose) found a strong association between chronic stressors and allostatic load in neuroendocrine, immune, cardiovascular and metabolic systems in older adults. Interestingly, Cohen et al. (2003) found that adults who experience negative emotions are at higher risk of developing a common cold, which is the most frequent cause of upper respiratory tract infections (URTIs) in older adults (Falsey et al., 1997; Falsey & Walsh, 2006). Psychological distress, negative well-being and psychosomatic symptoms (e.g., headache) were also associated with negative life events in men and daily hassles in women (Holahan et al., 1984).

Regarding ancient and modern stressors, inability to adapt and deal efficiently with modern stressors might result in higher allostatic load cost and thus greater impact on physical health (McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling & Eyer, 1988). In order for the present study to examine associations between ancient and modern stressors with physical health symptoms, the total number and severity of common cold symptoms will be considered. Previous research has examined gender differences in the presence and severity of common cold symptoms (Macintyre, 1993); the severity of common cold symptoms between clinical and non-clinical groups (Prasad, Fitzgerald, Bao, Beck, & Chandrasekar, 2000); and the association between psychological stress and severity of URTIs (Cohen et al., 1999).

Gender and age differences have been examined extensively in relation to physical health and illness. A literature review by Mayor (2015) showed that gender

differences in physical health derive from social constructs and people's exposure, appraisal and coping with stressors. Gender differences have been identified in the assessment of common cold symptoms from adults; men exaggerated the severity of symptoms (Macintyre, 1993) whereas women reported a greater number of physical symptoms (Van Wijk & Kolk, 1997). Regarding age differences across the adult lifespan, older adults considered themselves as more susceptible and vulnerable to illness than younger adults but better-equipped and resilient to control their emotions and stress while ageing (Prohaska, Leventhal, Leventhal, & Keller, 1985). For example, regarding chronic stressors and illness, older adults revealed a greater physiological cortisol response compared to younger adults because of aging brain and hormonal dysregulation, with older females indicating an increased cortisol response in HPA axis activity compared to older males (Bale & Epperson, 2015).

This is the first study to explore associations between ancient and modern stressors with cold symptoms and potential gender differences in older adults. Based on previous literature and findings, it is expected that modern than ancient stressors will be associated with more cold symptoms. It is also expected that older adults will report more symptoms in modern stressors because of their susceptibility and vulnerability to illness; older adults will be less able to adapt and deal with modern than ancient stressors. Building upon study one, this study will strengthen the transition from an anthropological/evolutionary to a psychological perspective regarding ancient and modern stressors linking them with physical health (McEwen & Stellar, 1993).

6.2.4 Aims of study

The main aim of this second mixed-methods study is to explore the feasibility of distinguishing between ancient and modern stressors in older adults within a health

context in relation to psychological characteristics. Regarding the quantitative analysis, correlations and multiple regression will examine associations between ancient and modern stressors with shame and guilt, and cold symptoms. This initial quantitative work is important to inform and conduct the interviews. The aim of the qualitative analysis (i.e. deductive content analysis; CA) is to explore whether the stress appraisal and stress experiences of older adults provide evidence of underlying psychological stressor characteristics to distinguish between ancient and modern stressors.

Thus, the objectives of the present study for the quantitative phase are:

- to identify associations between ancient and modern stressors with shame and guilt
- to explore associations between ancient and modern stressors with common cold symptoms

For the qualitative phase, the objectives are:

- to identify a range of different responses as to how older adults were thinking and feeling about stressful events and why
- to examine whether the experience of shame and guilt differs for men and women in ancient and modern stressors
- to investigate if coping with ancient and modern stressors is different for men and women
- to explore in-depth any underlying psychological characteristics regarding ancient and modern stressors
- to verify the application of psychological characteristics within the ancient and modern stressors context

Confirmation of the provisional distinction between ancient and modern stressors based on the psychological characteristics could further provide a plausible and justifiable rationale to make a distinct classification of specific life event stressors as ancient and modern. It would also add insight about the nature of this distinction with regard to the age of the population.

6.2.5 Hypotheses of quantitative phase of study

In order to examine associations between ancient and modern stressors with shame, guilt, and common cold symptoms in older adults, the hypotheses are as follows:

1. Ancient and modern life event stressors will be positively associated with shame and guilt in older adults.

1a. The total number of modern stressors will be a stronger positive predictor of shame and guilt than the total number of ancient stressors.

1b. The severity of modern stressors will be a stronger positive predictor of shame and guilt than the severity of ancient stressors.

2. Modern life event stressors will be associated with higher levels of physical health symptoms (i.e. cold symptoms) in older adults than ancient stressors.

2a. The total number of modern stressors will be a stronger positive predictor of the total number of common cold symptoms than the total number of ancient stressors.

2b. The severity of modern stressors will be a stronger positive predictor of the severity of common cold symptoms than the severity of ancient stressors.

3. Gender (both males and females), shame and guilt will exacerbate as moderators the relationship between ancient and modern stressors with physical health symptoms.

6.3 Method

6.3.1 Design

A cross-sectional design using a mixed-methods approach was selected for study two and assessed ancient and modern stressors (IV), shame and guilt (DV), and cold symptoms (DV). The diagram below illustrates the design and implementation of the present study (Figure 6.1).

Quantitative and qualitative research methods were employed to gather and analyse the data. In phase one, a series of self-report psychological questionnaires were used to measure a range of stressors, i.e. life events, hassles, perceived stress, the SCEs of shame and guilt, and common cold symptoms (Dietrich et al., 2008; Tiralongo, Wee, & Lea, 2016). The completion of the questionnaires lasted about 35 minutes. Questionnaires were used to explore what psychological factors older adults found stressful and to test the hypotheses.

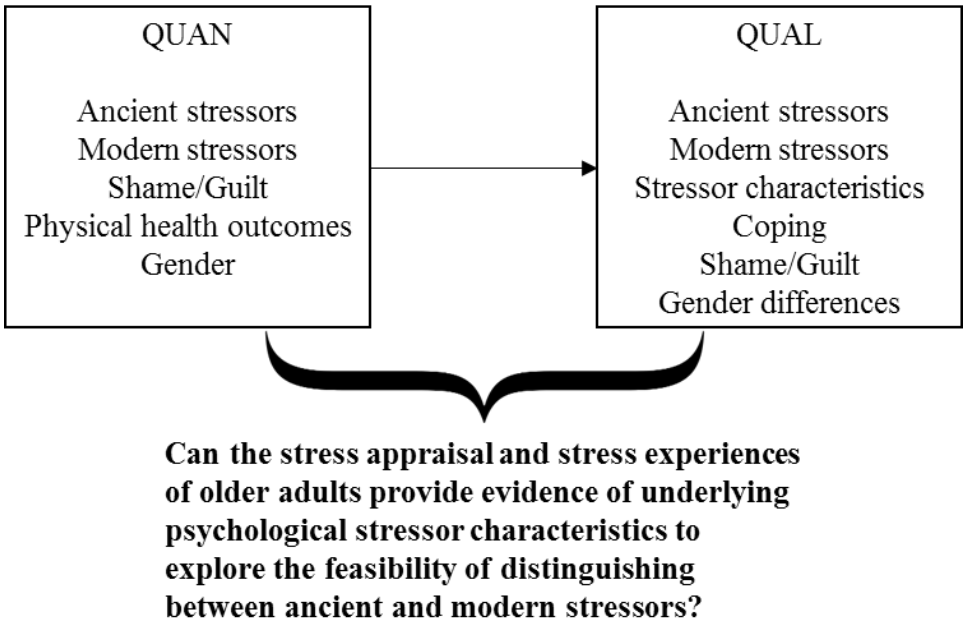

Figure 6.1. Diagram of the sequential mixed-methods methodology employed in study two.

As with study one, in the second phase, semi-structured interviews were conducted to ask participants specific questions referring to their questionnaire responses and about coping, shame and guilt, and physical health outcomes (al'Absi, 2011; Brown & Harris, 1989; Brugha et al., 1985; Fallon, 2008; Whiting, 2008). Participants were selected based on the total number of stressful items experienced (i.e. sum through descriptive statistics) and were drawn from the highest and lowest quartile of the sample to examine a range of different responses regarding life event stressors; semi-structured interviews explored, informed and explained the questionnaires data (Guest, MacQueen, et al., 2012). Semi-structured interviews were used to explore underlying psychological characteristics about ancient and modern stressors in older adults; and gender differences in coping, and shame and guilt experience.

6.3.2 Participants and recruitment

Seventy-five older adults (44 females) were recruited across Bath and North East Somerset to take part in phase one of the study (i.e. completion of questionnaires). Socio-demographic details were completed and reported in table 6.1. All participants were white/Caucasian and the majority to have been married, have obtained a bachelor's degree and have retired. Based on a power analysis with an estimated medium effect size of 0.15, power of 0.80 and alpha of 0.05, a sample size of 76-84 participants was required to enable meaningful quantitative analyses (Cohen, 1992).

All respondents consented to participate in the study (see chapter three). The participation response rate was 84%; 90 older adults were invited to participate and 75 older adults consented to take part. The in-person invitation was the most successful recruitment method attracting the majority of the participants (n = 65; 87% of the sample). Other recruitment methods involved flyer advertisements placed in the local newspaper, central library and local community notice boards (n = 7); via electronic noticeboard and newsletter adverts for local community groups (n = 3); and contacting retirement homes in the local area to seek permission to advertise the study.

Following the analysis of the questionnaire data, 20% of the initial cohort (n = 16 participants) was selected and re-contacted to participate in the interview (phase two); a total of 21 older adults (14 females) was recruited, consented and participated. The interviews ranged in length from 30 to 90 minutes (M = 54.05 minutes, SD = 22.28) (Table 6.2).

Table 6.1

Participant socio-demographic information (N = 75)

		Mean	*Standard Deviation (SD)*	Range
Age (in years)		68.95	5.30	60-75
			n	%
Ethnicity	White/Caucasian		75	100
Marital status	Single		4	5
	In a relationship		5	7
	Married		55	73
	Divorced		4	5
	Separated		2	3
	Widowed		5	7
Academic status	No schooling completed		3	4
	(Upper) Secondary education graduate		14	19
	Sixth form college		14	19
	Bachelor's degree		16	21
	Master's degree		9	12
	Doctorate/Professional degree		7	9
	Other		12	16
Employment status	Full-time employed		12	16
	Part-time employed		10	14
	Self-employed		4	5
	Retired		48	64
	Other		1	1

Table 6.2

Socio-demographic characteristics of interviewed participants (n = 21)

	Mean	*SD*	Range
Age (in years)	68.33	4.82	60-75
Total number of stressful items	9.10	6.32	3-22

		Lowest quartile *n*	Highest quartile *n*
Ethnicity	White/Caucasian	10	11
Marital status	In a relationship	0	2
	Married	9	8
	Widowed	1	1
Academic status	No schooling completed	1	0
	(Upper) Secondary education graduate	1	3
	Sixth form college	0	3
	Bachelor's degree	2	3
	Master's degree	4	1
	Doctorate/Professional degree	0	1
	Other	2	0
Employment status	Full-time employed	2	0
	Part-time employed	2	3
	Self-employed	1	2
	Retired	4	6
	Other	1	0

6.3.3 Measures

In study two, all participants were provided with an identical set of a series of self-report questionnaires, made up of five components (i.e. life events, daily hassles, perceived stress, shame and guilt, physical health). These standardised questionnaires

were selected in this study because they have been widely used in research and have high reliability and validity. Participants also provided some demographic information. Some of the quantitative and qualitative measures have been also used in study one (see section 4.3.3; Chapter four); only the differences in the use of those measures between studies one and two are noted here.

6.3.3.1 Psychological measures

6.3.3.1.1 Life Events Inventory (LEI)

Life events were assessed using the LEI (Tennant & Andrews, 1976) (see section 4.3.3.1.1). The modified 47-item inventory was used to measure the degree of distress caused by a life event in the last year. All items were rated on an 8-point Likert scale; 0 (*not happened*), and from 1 (*not at all stressful*), 4 (*moderately stressful*), to 7 (*extremely stressful*) if the life event had happened. For this study, the modified 47-item scale indicated a high level of internal consistency with the specific sample (Cronbach's $\alpha = .85$). Some scale items were amended and adjusted in order to fit the needs of the study and the sample age; for example, the word 'Sydney/Australia' to 'Bath/Europe' (see Appendix E).

6.3.3.1.2 Hassles Scale

Daily hassles were assessed using the Hassles and Uplifts Scale (DeLongis et al., 1988) (see section 4.3.3.1.2). The modified 63-item scale was used to measure how much of a hassle was each daily event in the past month. All items were rated on a 4-point Likert scale ranging from 0 (*none/not applicable*), 1 (*somewhat*), 2 (*quite a bit*), to

3 (*a great deal*). For this study, the modified 63-item scale indicated a high level of internal consistency with the specific sample (Cronbach's α = .96) (see Appendix E).

6.3.3.1.3 Perceived Stress Scale (PSS-10)

Perceived stress was assessed using the PSS-10 (Cohen et al., 1983) (see section 4.3.3.1.3). The 10-item version was scored on a 5-point Likert scale: 0 (*never*), 1 (*almost never*), 2 (*sometimes*), 3 (*fairly often*), 4 (*very often*) (see Appendix E).

6.3.3.1.4 Shame and Guilt

The SCE of shame was assessed using the experimental 35-item self-report Internalized Shame Scale (ISS) (Cook, 1988, 1996; Tracy, Robins, & Tangney, 2007). Cook (1988) argued that shame is internalised as a result of its association with individuals' life events of family losses and separation. This scale assessed the frequency of shame statements describing feelings and experiences with which individuals may be or not familiar from time to time; participants were asked to think about these statements and circle their response in each item. Thirty-five items were scored on a 5-point Likert scale ranging from 0 (*never*), 1 (*seldom*), 2 (*sometimes*), 3 (*frequently*), to 4 (*almost always*). The ISS provides a high internal consistency reliability coefficient (Cronbach's $\alpha \approx .95$) and a high test-retest correlation ($r = .81$) (Cook, 1988).

The SCE of guilt was assessed using the Guilt Inventory (GI); a 45-item self-report scale which measures trait guilt (20 items), state guilt (10 items describing current or recent guilt experience elicited from infringement of individuals' moral values), and general moral standards (15 items describing one's degree of loyalty and

importance to moral ethics) (Jones et al., 2000; Kugler & Jones, 1992; Tracy et al., 2007). Jones et al. (2000) claimed that guilt is elicited from moral transgressions and is having adaptive and maladaptive consequences for the individual according to its frequency, intensity and causes. A revised scale was used for the purposes of this study skipping the state guilt items because SCEs were examined as trait emotions in this research programme. Thirty-five items were scored on a 5-point Likert scale ranging from 1 (*strongly agree*), 2 (*agree*), 3 (*undecided*), 4 (*disagree*), to 5 (*strongly disagree*). The original items six, seven, 11, 13, 18, 22, 23, 28, 29, 32, 35, 39, 40, 41 and 44 were scored in the reversed direction; "1 = 5" and "2 = 4". Before statistical analyses, scores of GI were reversed so that high scores indicate greater levels of guilt and moral standards, thus ensuring statistical and conceptual clarity. Participants were asked to think about statements of guilt feelings and experiences and to circle their response in each item. Internal reliability for the GI varied from Cronbach's $\alpha = .79$ to $\alpha = .89$; test-retest correlations were found to be $r = .72$ for trait guilt and $r = .81$ for moral standards (Kugler & Jones, 1992). The GI provides a high internal reliability for the trait guilt (Cronbach's $\alpha = .89$) and moral standards (Cronbach's $\alpha = .88$) (Tracy et al., 2007) (see Appendix E).

6.3.3.1.5 Health and Illness Scale

Acute physical health outcome (i.e. common cold symptoms) was assessed using the Common Cold Questionnaire (CCQ): a nine-item self-report scale (Jackson et al., 1958); and the Wisconsin Upper Respiratory Symptom Survey (WURSS-21): a 21-item self-report scale (Barrett et al., 2009), both of which measure the intensity of URTI symptoms across four domains: general, nasal, throat and chest symptoms (Powell et al., 2008). The modified 18-item scale was scored on a 4-point Likert scale ranging

from 1 (*none*), 2 (*mild*), 3 (*moderate*), to 4 (*severe*) (Barrett et al., 2009; Farr et al., 1990; Jackson et al., 1958). Participants were asked to think whether they had experienced any common cold symptom in the last month and how intense it was, and to circle their response in each item. Space was provided at the end of the questionnaire for participants to include any additional current or acute physical symptoms not listed that had occurred in the last month. Reliability coefficients ranged from Cronbach's α = .87 to α = .97; WURSS-21 is significantly correlated (*r* = .85) with Jackson et al. (1958) scale (Barrett et al., 2009) (see Appendix E).

6.3.3.2 Qualitative materials

6.3.3.2.1 Semi-structured interviews and interview protocol

As with study one, the in-depth interviews in the present study were semi-structured (Irwin & Johnson, 2005; Willig, 2013). Based on participants' responses in psychological measures (phase one), a protocol for the interview was designed and used in order to follow on from the topics covered in the questionnaires (i.e. negative life events, daily hassles, shame and guilt, and cold symptoms) as well as experience, adaptation and coping with stressors in older adults (see chapter three, and sections 4.3.3.2.1 and 4.3.3.2.2; Chapter four).

The interview protocol used for study two was very similar to the protocol for study one as the ancient and modern stressors distinction was explored in older adults. The differences from the protocol in study one were: i) the interview protocol used for the present study comprised of seven questions, which were divided into three main sections; ii) section one had two questions of what life events and hassles older adults found stressful and why, and if emotions of shame and guilt were triggered by these stressors; iii) section two included four key questions about how the participants

adapted and dealt with stressors, whether participants had experienced before or not the stressor, and whether the stressor had physically affected their health; iv) section three had one question that was asked for every life event/hassle they had experienced ("How do you believe that you would think about and cope with this life event/hassle, if you experienced it in a younger age?"). The list of interview questions can be found in appendix F.

6.3.4 Procedure

The procedure followed for the present study was very similar to the procedure for study one (see section 4.3.4). The differences from the procedure in study one were: i) participants were required to attend a 35-minute laboratory appointment for phase one and an at least 30 to 80-minute appointment for phase two; ii) participants were also asked to provide their experiences and thoughts about psychosocial stressors, SCEs and cold symptoms compared with study one that participants discussed their experiences about stressors and SCEs.

6.3.5 Ethical considerations

The present study was granted full ethical approval from the ethics committee at Departmental level as required by the University and was in line with the BPS ethical guidelines (2009) on 15th April 2016 (ethics reference number: 16-057). Exclusion criteria included those aged under 60 and over 80 years based on Erikson's stages of human psychosocial development (Erikson & Erikson, 1998); those with severe mental or physical debilitating health conditions; those currently experiencing an acute health complaint; those suffering from any stress-related condition as far as they were aware.

Presence of ongoing chronic health conditions was not a basis for exclusion. Older adults' disability issues (e.g., hearing or mobility problems) were also considered prior to interviews in order not to discriminate any population from participation. Four questionnaires were completed in participants' homes (where permission was provided and lone working policy guidelines were observed at all times) and three interviews were conducted by telephone.

6.3.6 Ancient and modern stressors in older adults

In order to provide a plausible and defensible justification to provisionally distinguish between ancient and modern stressors, the a priori ancient and modern stressors designation from Schreier and Evans (2003) was taken into consideration. As with study one, the life event items from the Schreier and Evans list were matched with those life event items from the LEI list, which were at least to some extent similar in meaning (Table 6.3). With regard to this approach, only those life event items related to Schreier and Evans item list were used.

This resulted in a reduction to nine life event items which were quantitatively analysed; five ancient and four modern life event stressors. This allocation has been provided with empirical basis from Schreier and Evans (2003). The approach that was followed was vital first to explore the feasibility of distinguishing between ancient and modern stressors, second to verify the provisional designation that found in study one, and third to conduct the main quantitative analysis.

Table 6.3

Matching life event items between Schreier and Evans and LEI lists

Schreier and Evans life events	Ancient/Modern	Life Events Inventory
Another relative died with whom the child had a very close relationship.	Ancient	1. A close family friend or relative died.
A parent lost his/her job or has been unemployed.	Modern	2. You have been unemployed and seeking work for a month or more.
A parent, brother, or sister died.	Ancient	3. A close family member died (e.g., partner, child).
Our family had serious financial problems.	Modern	4. You had a major financial crisis.
A close family member had a serious medical problem (illness or accident) and was in the hospital.	Modern	5. You had a serious illness, injury or operation needing hospitalization, (or a month or more off work).
Our family has had to move a lot.	Ancient	6. You moved to Bath from elsewhere in the UK/Europe. You moved house in Bath.
A close family member was badly hurt or sick (but not in the hospital).	Ancient	7. A close relative had a serious illness (from which they did not die).
Our child was upset by family arguments. Our child has been involved in serious family arguments. Close family members have had serious arguments with each other.	Ancient	8. There has been increasing serious arguments with your partner. You had increasing arguments or difficulties with your partner. There has been a serious increase in arguments or problems with someone who lives at home (excluding your partner).
A close family member was away from home a lot. Our child's best friend moved away.	Modern	9. You have been separated from your partner for more than a month because of personal difficulties. You have been separated from your partner for more than a month (for reasons other than relationship difficulties). You have been separated from someone important to you (other than close family members).

Note. The Ancient/Modern indication presents the designation of life events items, as such classified by Schreier and Evans (2003).

6.3.7 Analytical plan

6.3.7.1 Statistical analysis

Concerning the first phase of the study, inferential statistics using Pearson's *r* correlations were conducted to analyse the quantitative data of questionnaires in SPSS. These were conducted to examine indicative associations between ancient and modern stressors with shame, guilt and cold symptoms. Multiple regression analyses were conducted to examine if shame, guilt and cold symptoms (DVs/outcomes) were best predicted by the total number and severity of ancient and modern stressors (IVs/predictors) and gender.

In order to determine whether gender, shame or guilt moderated the relationship between ancient and modern stressors with physical health outcomes, variables were centered at their grand mean prior to calculation of interaction terms (ancient stressors × gender; modern stressors × gender; ancient stressors × shame/guilt; modern stressors × shame/guilt) (Figure 6.2). Moderation analyses were conducted using simple regression analyses entering the predictor, moderator and their interaction term in the first block (Aiken et al., 1991; Baron & Kenny, 1986; Howell, 2013).

6.3.7.2 Content analysis

Regarding the qualitative phase of the study, the interviews were fully transcribed and analysed using CA (Bengtsson, 2016; Hsieh & Shannon, 2005; Mayring, 2014; Vaismoradi et al., 2013) (see chapter three). The rationale behind this deductive analysis was to explore whether the stress appraisal and experiences of older adults provide similar evidence of underlying psychological characteristics in order to distinguish between ancient and modern stressors. As with study one, the text passage

of each life event (from Table 6.3) was thoroughly examined to identify and potentially verify any characteristics for ancient and modern stressors based on the a priori designation from Schreier and Evans (2003). Secondary aims were to explore gender differences in coping and shame and guilt experiences in relation to ancient and modern stressors.

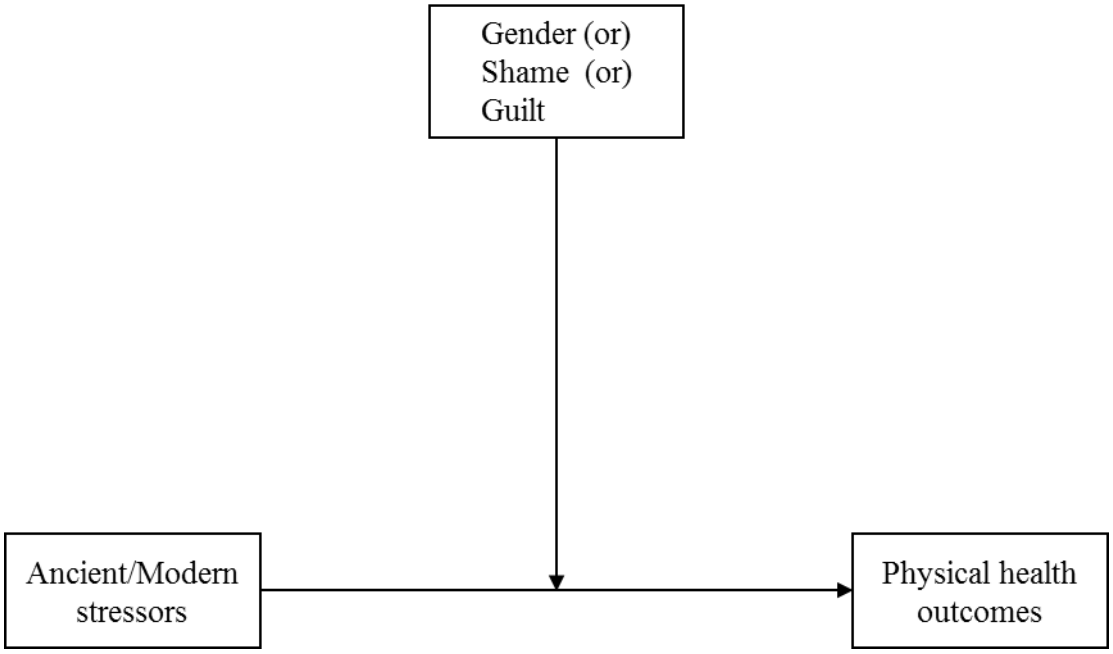

Figure 6.2. Diagram of conceptualisation of gender or shame/guilt as moderators of the ancient and modern stressors and physical health outcomes relationship.

6.4 Results

6.4.1 Data screening

Prior to conducting correlations and multiple regressions, data screening was conducted and assumptions were tested. Approximate normality of the data was assessed using histograms (with normal distribution curves), mean skewness and kurtosis scores and the Kolmogorov-Smirnov normality test. Using square root transformation, logarithm 10, and inverse, histograms of standardised residuals (errors) did not show a better distribution close to normal curves. In order not to violate this

assumption, the robust method of bootstrap was used (Dancey & Reidy, 2011; Field, 2013; Ghasemi & Zahediasl, 2012; Hair et al., 2010; Tabachnick & Fidell, 2007).

6.4.2 Descriptive statistics

The summary statistics, including the mean, standard deviation and range (minimum-maximum) of the variables of interest are presented in Table 6.4. The total number of ancient stressors experienced by older adults was greater than modern stressors. A higher severity score was reported from older adults for ancient than modern stressors. Older adults also reported higher levels of guilt than shame.

6.4.2.1 Preliminary analyses

Pearson's *r* correlations between the IVs and DVs are presented in Table 6.5. Significant positive correlations were found between the predictors and shame and cold symptoms (hypotheses 1 and 2). A significant negative association was found between the mean severity of ancient stressors and guilt (hypothesis 1). A significant positive association was also found between gender and shame; women reported greater shame than men.

Table 6.4

Means, standard deviations (SD in brackets) and range of psychological variables, shame, guilt and physical health symptoms (N = 75)

Measures	*Mean*	(*SD*)	Range
Psychological variables score			
Total number Ancient Life events	1.33	(1.40)	0.00-5.00
Total severity Ancient Life events	5.33	(6.48)	0.00-25.00
Mean severity Ancient Life events	2.37	(2.18)	0.00-6.25
Total number Modern Life events	.35	(.69)	0.00-4.00
Total severity Modern Life events	1.60	(4.02)	0.00-28.00
Mean severity Modern Life events	1.13	(2.11)	0.00-7.00
Perceived stress	14.65	(7.52)	0.00-36.00
SCEs score			
Shame	.69	(.75)	0.00-2.89
Guilt	3.14	(.40)	2.28-4.24
Physical health symptoms score			
Total number Symptoms	3.89	(4.90)	0.00-15.00
Total severity Symptoms	9.75	(12.96)	0.00-44.00
Mean severity Symptoms	1.26	(1.26)	0.00-3.29

Table 6.5

Correlations of ancient and modern life event stressors with shame, guilt and physical health symptoms (N = 75)

Psychological variables	Shame[a]	Guilt[a]	Total number symptoms[a]	Mean severity symptoms[a]	1	2	3	4	5	6
1. Total number Ancient Life events[a]	.183	-.139	.254*	.270*	-	.725***	.328**	.347**	.303**	.045
2. Mean severity Ancient Life events[a]	.312**	-.336**	.185	.172		-	.310**	.310**	.386***	.170
3. Total number Modern Life events[a]	.317**	-.137	.220	.310**			-	.845***	.342**	-.010
4. Mean severity Modern Life events[a]	.228*	-.072	.261*	.346**				-	.287*	.060
5. Perceived stress[a]	.745***	-.382***	.203	.281*					-	.312**
6. Gender[a]	.413***	-.200	.126	.070						-

Note. [a] bootstrapped; * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

6.4.3 Inferential analyses

6.4.3.1 Main effects

Regarding hypothesis 1a, a multiple regression was conducted with shame as the dependent variable. Using the enter method, the total number of ancient and modern life event stressors, and gender were entered at step one as the predictors. Results revealed that the total number of modern stressors and gender contributed significantly to the regression model ($R^2 = .28$, $F(3, 71) = 9.10$, $p < .001$) and accounted for 25% of the variation in shame. The analysis showed that the total number of modern stressors ($p = .018$) and gender ($p = .001$) were significant predictors of shame (Table 6.6) (Field, 2013).

Table 6.6

Summary of multiple regression analysis for variables predicting shame[a]

Predictors	*B* (*SE*)	β	95% CI
Total number Ancient Life events[a]	.036 (.061)	.070	-.069, .165
Total number Modern Life events[a]	.327* (.149)	.300	-.072, .535
Gender[a]	.628*** (.139)	.413	.347, .891

Note. *B*: unstandardized coefficient; *SE*: standard error; β: standardized coefficient; 95% CI: confidence intervals; DV/outcome: shame; [a] bootstrapped
Gender, coded: 1 = Male, 2 = Female.
$R = .527$; $N = 75$
* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

A multiple regression with guilt as DV and total number of ancient ($p = .428$) and modern ($p = .442$) stressors as IVs did not reveal any significant predictors.

Regarding hypothesis 1b, a multiple regression with shame as DV and the mean severity of ancient (p = .065) and modern (p = .194) stressors did not reveal any significant predictors.

A multiple regression was also conducted with guilt as DV. Using the enter method, the mean severity of ancient and modern stressors were entered at step one as the predictors. Results revealed that the mean severity of ancient stressors contributed significantly to the regression model (R^2 = .11, F(2, 72) = 4.32, p = .017) and accounted for 8% of the variation in guilt. The analysis showed that the mean severity of ancient life events (p = .010) was a significant predictor of guilt (Table 6.7) (Field, 2013).

Table 6.7

Summary of multiple regression analysis for variables predicting guilt[a]

Predictors	*B* (*SE*)	β	95% CI
Mean severity Ancient Life events[a]	-.061** (.022)	-.336	-.106, -.019
Mean severity Modern Life events[a]	.006 (.022)	.032	-.037, .052

Note. *B*: unstandardized coefficient; *SE*: standard error; β: standardized coefficient; 95% CI: confidence intervals; DV/outcome: guilt; [a] bootstrapped

R = .327; N = 75

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

Regarding hypothesis 2a, a multiple regression with total number of common cold symptoms as DV and total number of ancient (p = .146) and modern (p = .234) stressors as IVs did not reveal any significant predictors.

Regarding hypothesis 2b, a multiple regression was conducted with mean severity of common cold symptoms as DV. Using the enter method, severity of ancient

and modern stressors were entered at step one as the predictors. Results revealed that modern stressors' severity contributed significantly to the regression model (R^2 = .12, $F(2, 72) = 5.10$, p = .008) and accounted for 10% of the variation in symptoms' severity. The analysis showed that the modern stressors' severity (p = .010) was a significant predictor of cold symptoms' severity (Table 6.8) (Field, 2013).

Table 6.8

Summary of multiple regression analysis for variables predicting mean severity of common cold symptoms[a]

Predictors	*B* (*SE*)	β	95% CI
Mean severity Ancient Life events[a]	.041 (.070)	.072	-.098, .162
Mean severity Modern Life events[a]	.193** (.071)	.323	.063, .333

Note. *B*: unstandardized coefficient; *SE*: standard error; β: standardized coefficient; 95% CI: confidence intervals; DV/outcome: mean severity of common cold symptoms;
[a] bootstrapped

R = .352; N = 75

* $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

6.4.3.2 Moderation effects

Regarding hypothesis 3 and considering the findings from the multiple regressions, moderation analysis was conducted using simple regression to examine the interaction between the total number of ancient stressors and gender (p = .467), and total number of modern stressors and gender (p = .551) on mean severity of common cold symptoms. Moderation analyses were also conducted to test the interaction between the mean severity of ancient stressors and gender (p = .430), and mean severity

of modern stressors and gender (p = .124) on mean severity of common cold symptoms. No interaction effects were found.

Moderation analyses were conducted using simple regression to examine the interaction between the total number of ancient stressors and shame (p = .879) and guilt (p = .771), and the total number of modern stressors and shame (p = .335) and guilt (p = .604) on mean severity of common cold symptoms. Moderation analyses were also conducted between the mean severity of ancient stressors and shame (p = .863) and guilt (p = .214), and mean severity of modern stressors and shame (p = .953) and guilt (p = .510) on mean severity of common cold symptoms. No significant interaction effects were found.

6.4.4 Qualitative content analysis findings

In order to make a distinct classification between ancient and modern stressors exploring the experiences of older adults, a CA was conducted in the matched life event stressors (from Table 6.3). Descriptions of life events were coded in relation to the psychological characteristics identified in study one in order to identify any regularities corresponding to whether the life events were designated as ancient or modern. As with study one, an ancient and a modern life event stressor are presented as indicative examples to show specific underlying characteristics for ancient and modern stressors. To ensure rigour and trustworthiness of the coding and designation of life events, an inter-rater reliability test was conducted.

To ensure reliability and avoid bias, six researchers independently categorised a sample of random quotes into the ten stressor characteristics' categories (Table 5.5; Chapter five). The overall criterion of agreement/consensus on the coding showed an almost perfect inter-rater reliability agreement, $\kappa = .83$, $p < .001$, 95% CI [.700, .961]

(Altman, 1990; Fleiss et al., 2003; Landis & Koch, 1977). This implies that quotes categorised only on the left side of the continuum confirmed the designation of the stressor as more ancient, and quotes on the right side reflected the stressor as more modern. This inter-reliability accords with the a priori designation from Schreier and Evans.

The deductive CA conducted in the life events of the older adult sample population data verified the psychological characteristics that found to underlie ancient and modern stressors (see section 5.5.4; Chapter five). The categories and definitions for the ancient and modern stressor characteristics can be found in the previous chapter (Table 5.5). The psychological characteristics for ancient stressors in older adults were: adaptive coping, past experience, controllability/predictability, short duration, and simple type of stressor. The characteristics for modern stressors were: maladaptive coping, novel experience, unpredictability/uncontrollability, long duration, and complex and multiple stressors. Coding of random quotes from life event stressors into the categories is presented in table 6.9 providing evidence for the designation of stressors as ancient and modern in relation to psychological characteristics.

The modern-designated life event "You have been unemployed and seeking work for a month or more" has not been experienced by older adults. However, older adults had experienced the modern-designated life event "You had a major financial crisis", which had not been experienced by younger adults in study one. Table 6.10 presents a series of quotes into the psychological characteristics' categories supporting the designation of the life event "A close family friend/relative died" as ancient stressor, in accordance with the evidence from younger adults in study one. Table 6.11 presents evidence to support the designation of the life event "You had a serious illness/injury needing hospitalization or a month or more off work" as modern stressor.

Table 6.9

Sample of quotes' coding into the psychological stressor characteristics

Quotes	Life event	Stressor characteristics	Designation
I have many brothers and sisters so with an ill relative it's easier because in order to deal with it we talk to each other, we email each other and agree who is going to do practical things and we share it between us …. Yes, I found it easy to adapt.	Health/illness of others	Adaptive coping	Ancient
I think it was really distressing but I have experienced it before. It was resolved in the end but it was really stressful.	Social/interpersonal arguments	Past experience	Ancient
This was not the first time because she had two operations before the last one.	Health/illness of others	Past experience	Ancient
I did not feel like I was lacking control. I suppose because it was an event I shared with others…	Health/illness of others	Controllability/Predictability	Ancient
We have been together for so many years so I know him well.	Social/interpersonal arguments	Controllability/Predictability	Ancient
And there were a few nights that the TV was so loud that we couldn't sleep and we went to the other bedroom…	Social/interpersonal arguments	Short duration	Ancient
My daughter was suffering from ulcerative colitis and was in the hospital.	Health/illness of others	Simple stressor	Ancient
My wife was diagnosed with ovarian cancer.	Health/illness of others	Simple stressor	Ancient

Table 6.9 (continued)

Quotes	Life event	Stressor characteristics	Designation
Overall, I think money always is an issue. And you can never feel secured about your finance. Even if you retire, you might need to do some casual jobs to add up your pension. And when you are aging, it's even more difficult to be financially secure. You can never take huge control over financial difficulties.	Financial problems	Maladaptive coping	Modern
I needed to leave my house last year because of some works that we needed to do and to be honest out of the blue. It was just terrible. They needed to fix some of the water pipes but then other things turned up. We've been living in there the last fifteen years. I was denying to move. I had my husband to arrange everything. It took me so long to get used to this new situation of leaving and moving somewhere else. Needless to say, that I am a 65 years old woman.	Movement	Maladaptive coping	Ancient
You might expect that this might happen at some point but probably I was never ready to face it and control all this stress.	Separation/distance	Uncontrollability/Unpredictability	Modern
However, this separation has been continuous for 6 years.	Separation/distance	Long duration	Modern

Table 6.9 (continued)

Quotes	Life event	Stressor characteristics	Designation
It took me about two months to start thinking more calmly about this event but I was missing him.	Separation/distance	Long duration	Modern
Without the help of my two daughters it would have been very difficult for us. It was not only the movement, it was the fact that I was leaving my family home where I was born, raised, left, came back, got married, lived there. And now we need to pay for rent in our brand-new house… no, it's not my house. Anyway, I still don't like this. I want to go back.	Movement	Complex/Multiple stressors	Ancient
I contracted a streptococcal infection in my throat which affected my epiglottis and surrounding tissues making it very difficult for me to breathe.	Health/illness of self	Complex/Multiple stressors	Modern
I got a permanent loss of sight in my left eye due to burst blood vessels- only 50% vision now possible. This obviously affects my life.	Health/illness of self	Complex/Multiple stressors	Modern

Table 6.10

Quotes and stressor characteristics supporting the ancient designation of the life event 1. "A close family friend or relative died"

Quotes	Stressor characteristics
For some reason, I have been really busy for the last three years. Busier that I've been the rest of my life. I'm focusing more on my work than ever... And I think this kind of thing is like a strategy to deal with the death of others. This is the main way of dealing with it. I think I needed to talk more about these things. And it was an effective way. I do cry sometimes… It was a healthy way to release some things along with counseling.	Adaptive coping
I put everything aside and I spent my whole time with her. So I wasn't seeing people because I was spending time with her. Well I was with her a lot before she died. I was with her the day before she died. And then when she died I wrote a speech for her funeral and that helped a lot. I keep in contact with her children. So I think it's a normal grieving process I went through, nothing too extreme. I can adapt. I can pick myself through them and analyse them. It was an effective coping way because I was a registered nurse for a very long time so I have come in contact with a lot of pain and suffering and also death in my life. So I suppose I have learnt over the years how to cope with these things a bit more, even though some of them or most of them I didn't have anything to do with them.	Adaptive coping
I had nursed many patients with terminal cancer and always considered myself a third person, I was happy to nurse the girls' father as it was his wish and I did succeed. I dealt with the situation in a professional way.	Adaptive coping
The close family member who died was my sister. It was a very similar experience when my mother died when I was about thirty but this time I coped much better.	Adaptive coping
Of all of these, grief is the most powerful and longest lasting. I would not have described myself as a committed or deeply religious person but I was a reasonably regular church attendee and had a degree of faith.	Adaptive coping
In the last few years, several close friends have died. In the last two weeks another close friend died.	Past experience

Table 6.10 (continued)

Quotes	Stressor characteristics
I have experienced it in the past and I am experiencing it more and more the older I get. More people are dying.	Past experience
…although I was a trained nurse with experience. I had nursed many patients with terminal cancer…	Past experience
I can come to terms with a person dying, I can come to terms with the idea of dying before they die, I can come to terms with the idea of loss and yet something in my mind is something childish and I am not taking the full significance of it like a child and around the time of dying or death, my worries and my concerns are to look after other people who are still alive, and I'm not thinking of myself.	Controllability/Predictability
She did have cancer so it was expected that she would die.	Controllability/Predictability
As already stated I had nursed my husband and many others…	Controllability/Predictability
I grieved for a few days and then I was okay.	Short duration
It was my best friend, died.	Simple stressor
In the last few years, several close friends have died. In the last two weeks another close friend died.	Simple stressor
The close family member who died was my sister.	Simple stressor

Table 6.11

Quotes and stressor characteristics supporting the modern designation of the life event 5. "You had a serious illness, injury or operation needing hospitalization, (or a month or more off work)"

Quotes	Stressor characteristics
And I was pushing myself too hard. And that was not good for my body and my heart resulting in decreasing my stamina. It was stressful, and it is a bit now, because I didn't know what the issue is. I didn't want to be an elderly person. And this is something which is coming along with ageing and you realise that you can't do this anymore. I didn't want to accept it. I can't actually adapt.	Maladaptive coping
I had before summer, actually a year of tract infections. I wasn't hospitalised but I was hospitalised a lot of years ago when I had a nervous breakdown. I had a depressive psychosis. I was having terrible thoughts and I was thinking that I would do some bad to myself and others.	Maladaptive coping
I had a knee replacement. I had a very serious car accident a few years ago and that affected my health overall. It affected me really bad. And now as I am getting older, these physical things, bones etc., turn up. So my knee is affecting me now because I have got pain and things like this.	Maladaptive coping
It was stressful because I have got a lot of arthritis, I mean pain a lot of the time and saying that was one more thing. And I cannot stand. I've got my knees, my hips, my back, my neck, my head in pain but when my shoulders started to pain I said no that is too much. I did get very stressed about it. It has been partially treated by the doctors, I had an operation, but still… But it was a lot of aches and pains and it was just enough. No, I didn't. I could not just get over it. All this pain, it has been related to my spine. I get really upset because I can't do any walk. I've got a disabled thing in my car because it really hurts my back.	Maladaptive coping
I got a permanent loss of sight in my left eye due to burst blood vessels- only 50% vision now possible. This obviously affects my life. It was difficult to deal with it because we did not know the cause after several visits to the eye clinic and all medical checks. I have not coped well.	Maladaptive coping

Table 6.11 (continued)

Quotes	Stressor characteristics
And speaking about a heart valve surgery it's something new and stressful and worrying and unexpected and…	Novel experience
…and something I had never experienced before in that intensity.	Novel experience
It is additionally frustrating because I have never experienced an infection on this scale before. This was the first time in my life that I have experienced such difficulty in breathing and I don't ever want to experience it again.	Novel experience
I had no previous experience of this vertigo before.	Novel experience
It was stressful because it was caused by something I couldn't control I suppose. The stress was just intolerable…	Uncontrollability/Unpredictability
This was the first time in my life that I have experienced such difficulty in breathing and I don't ever want to experience it again.	Uncontrollability/Unpredictability
I have not coped well. I am 72 in April and my working life is slowly reduced and I am not relaxed about the possibility of future complications.	Uncontrollability/Unpredictability
It came on suddenly and unexpectedly and kept me off work for approximately 2 weeks although the impact of it lasted for many years. Health-related issues mean you have little control of a part of your life…	Uncontrollability/Unpredictability
…but I was hospitalised a lot of years ago when I had a nervous breakdown …. it was an ongoing situation for ten years.	Long duration
And also the surgery and being in the hospital was… stressful and painful and long-lasting.	Long duration

Table 6.11 (continued)

Quotes	Stressor characteristics
It is an on-going experience with reduced hearing.	Long duration
I am suffering from anxiety since 2015.	Long duration
Well I've always had a few problems that are getting worse with ageing I suppose …. And I was pushing myself too hard. And that was not good for my body and my heart resulting in decreasing my stamina. It was stressful, and it is a bit now, because I didn't know what the issue is. It was actually my health that affected my life.	Complex/Multiple stressors
I was in the hospital in a while and it was related in the living conditions in the place I lived because basically we had been told that it was unsafe, the whole place would collapse because of some environmental issues, e.g. nuclear problems and inappropriate concrete and it was an ongoing situation for 10 years. And it needed a lot of money from the government to start resolving this issue. And then the whole place was divided for and against a solution and my house was one of the affected.	Complex/Multiple stressors
I am "partially deaf" and I cannot hear at all. It is really difficult to cope even with hearing aids. It has changed my everyday life.	Complex/Multiple stressors
I was diagnosed with Ménière's disease, a rare disorder that affects the inner ear. It came on suddenly and unexpectedly and kept me off work for approximately two weeks although the impact of it lasted for many years. The main problem initially was the feeling of being dizzy and being unable to move, even turn in bed, for about a week without being sick or nauseous. This sense of imbalance on turning my head gradually diminished but lasted for over 6 months.	Complex/Multiple stressors

Regarding ancient stressors, older adults were able to adapt and cope with the stressors; adaptation and coping led to favourable outcomes. They had experienced these stressors before, could take control over them and expected them to occur. Ancient stressors lasted for a short period of time and when older individuals referred to them they mentioned that they experienced a specific stressful situation. Coding of modern stressors indicated that older adults were less able to adapt and deal efficiently with these stressors compared to ancient stressors, which led to unfavourable outcomes. They found these stressors novel (e.g., financial problems) and long-lasting, which they could not control or predict. Older adults experienced a series of stressful events which affected one another and made the whole situation more stressful and complex.

Not only do these findings verify the findings of study one, but they also provide additional supportive evidence from a different population that there are psychological correlates of the ancient and modern stressors designation of Schreier and Evans (2003). This study also treated the life event of movement as an ancient stressor. This links with the designation of movement as an ancient stressor and was used as such in study one. Despite this, the psychological characteristics associated with this stressor suggested that it might best be designated as a modern stressor; thus future research could consider a potential re-designation of this life event.

Figure 6.3 provides information for older adults regarding the frequencies of ancient and modern stressors that fall into each stressor category. As with study one, the ancient life event of movement appears more in the modern side of the continuum. Although there is little evidence of some ancient stressors which fall into the more modern end, this figure (compared to the figure 5.4 for younger adults) provides a clearer indication of the distinction between ancient and modern stressors. Also, each interviewed older participant and life event were placed along a severity Likert scale

that was adopted from the LEI (Figure 6.4). As was the case with younger adults, older adults appraised ancient stressors mainly as slightly/moderately stressful, whereas modern stressors were judged as being more stressful. This implies that older adults experienced ancient stressors as less stressful compared to modern stressors due to their ability to adapt and cope. Interestingly, older adults compared to younger adults did not find modern stressors as extremely stressful probably due to their greater lifetime experience and acquired coping skills to deal with stressful situations.

6.4.5 Older adults' gender differences in coping, shame and guilt regarding ancient and modern stressors

Qualitative analysis showed that male and female older adults coped with ancient stressors in a similar way. Therefore, no gender differences were identified. Both were able to use a range of problem and emotion-focused coping strategies (i.e. adaptive coping); supportive evidence with illustrative quotes can be found in table 6.12. The most identifiable coping mechanism that male and female older adults used was active coping. Interestingly, older adults also employed their past experiences to deal with ancient stressors; a coping mechanism that had not been used by younger adults in study one. Regarding modern stressors, any form of adaptive coping was not identified as expected.

Interviewed older adult participants also revealed their experiences about shame and guilt in ancient and modern stressors. The SCEs of guilt and shame were reported by both male and female older adults in stressful ancient and modern life events; supportive evidence with illustrative quotes can be found in table 6.13. This finding has been congruent with the findings for younger adults in study one (see section 5.5.4.1; Chapter five).

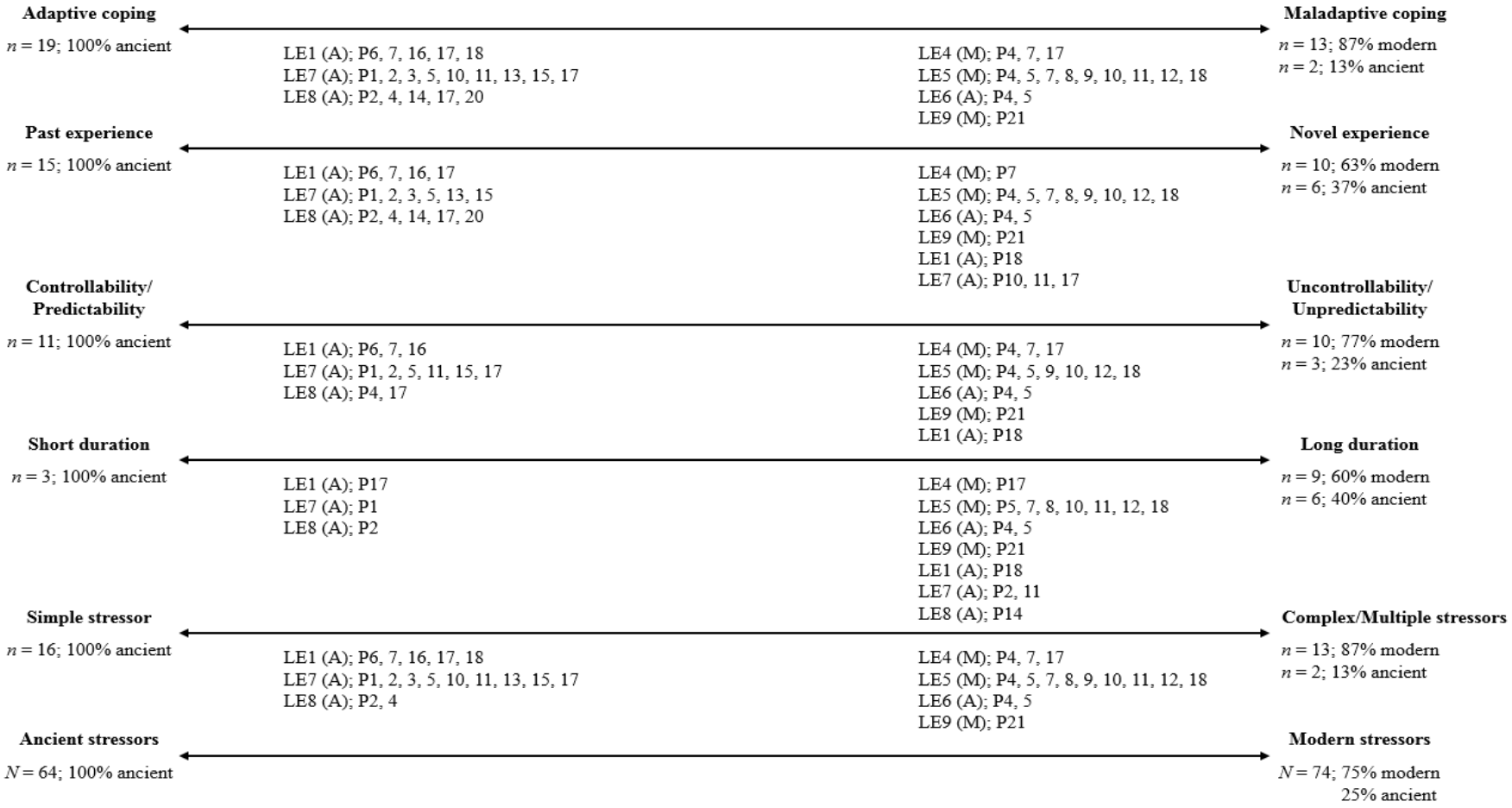

Figure 6.3. Diagram illustrating the frequencies in percentages (%) of ancient and modern life event stressors that fall along the line of each stressor characteristics' category for older adults.

n/*N*: number of quotes; LE: life event (e.g., LE1: life event no 1 from table 6.3); A/M: ancient or modern (as designated from Schreier and Evans, 2003); P: participant (e.g., P6: participant no 6)

Ancient stressors	7 Extremely stressful	6	5	4 Moderately stressful	3	2	1 Not at all stressful	2	3	4 Moderately stressful	5	6	7 Extremely stressful	**Modern stressors**
		LE1P17	LE1P6	LE1P18	LE1P7					LE4P4	LE4P7	LE5P5	LE5P9	
		LE7P15	LE1P16	LE7P1	LE3P18					LE4P17	LE5P8	LE5P7		
			LE7P3	LE7P2	LE7P11					LE5P4	LE5P10			
			LE7P5	LE7P10	LE7P17					LE5P11	LE5P18			
				LE7P13	LE8P2					LE5P12				
				LE6P4	LE8P4					LE9P14				
				LE6P5	LE8P14					LE9P21				
					LE8P17									
					LE8P20									

Figure 6.4. Diagram showing the severity of ancient and modern as experienced by older adults. This severity ancient/modern stressors Likert scale illustrates how much stressful each life event was for each interviewed participant. For example, LE5P9 indicates that participant no 9 found the life event (no 5) health/illness of self, which has been designated as a modern stressor, extremely stressful.

Ancient stressors: Bereavement/death (LE1, LE3); Movement (LE6); Health/illness of others (LE7); Social/interpersonal arguments (LE8)

Modern stressors: Financial problems (LE4); Health/illness of self (LE5); Separation/distance (LE9)

Table 6.12

Indicative male and female older adults' quotes regarding adaptive coping with ancient stressors

Quotes	Life event	Adaptive coping	Gender
I had to put it out of my mind as much as possible. We had hard to accept this situation and gradually came to terms with the situation. We had children that lived at home and I think a problem shared may have helped. We can adapt to this situation because of the experience we have on this situation.	Health/illness of others	Social support Acceptance or Denial Past experience	Female
So there is a manager of the flats. So I went and spoke to him. We agreed that he would have a word with her.	Social/interpersonal arguments	Active coping Social support	Male
So I am trying to cope with him so he copes with her. I think I am adapting and actually because the way I cope is that I am focusing on practical help. And I am trying to do my best when I am there.	Health/illness of others	Active coping	Male
… who has some problems with mental health issues sometimes. Also you can't do anything about it. You can't recognise any symptoms. We are trying to be supportive but it's tricky.	Health/illness of others	Acceptance	Female
It's been quite complicated because I am getting really stressed and I am seeing a counsellor here as well as my wife which is really good to feel better about yourself. I do tend to push things in the background and move on. But this doesn't happen always so it's good to have a good counsellor and talk about these issues. Through counselling I resolved it and moved on and left stuff behind.	Social/interpersonal arguments	Active coping Acceptance or Denial	Male

Table 6.12 (continued)

Quotes	Life event	Adaptive coping	Gender
This relates to my old son. I have tried successfully to mediate our relationship either directly or indirectly. I've got the experience and I am not prone to worry about things that I can't do anything about. I have had a lot of psychotherapy.	Social/interpersonal arguments	Active coping Past experience	Female
I moved down to look after both her and my teenage grandson, whilst she was in hospital and when she returned home. Once I got into a routine it was adjustable…	Health/illness of others	Active coping	Male
My husband has always been argumentative as this is getting more over time but I would say it is easy to cope with it. We have been together for so many years so I know him well.	Social/interpersonal arguments	Past experience	Female
My partner is very supportive of me. I spent a lot of time thinking about it and wondering what I could do to make things better. I dealt with it in lots of ways. My husband and I talked about it, which is very helpful, especially as he understands me. I talked to a friend, too. I should say I've had a lot of psychotherapy. So my personal history, perspective and experience all helped me to cope and feel better. I also write, and I've written some personal journal entries and that is always helpful. Having a creative outlet is one of the most useful things I know for emotional disturbance.	Bereavement/death	Social support Active coping Past experience Self-distraction	Female

Table 6.13

Sample of shame and guilt quotes in ancient and modern stressors

Quotes	Life event	SCEs
Guilty and anxious. Guilty because when these things happen you are thinking "Oh no, that mean that I can't go to my class or I can't do this and now I have got to get the train and visit my parents". And then I am feeling guilty because I am thinking of my own inconvenience rather than the force of compassion and the feeling of concern, anxiety, worry about the distress, and how they are feeling. The only shame-related feeling would be against my siblings if I am feeling that I am not putting my weight as a member of the family but we have a mutual understanding between us and we are all doing what we can and it depends on when these things happen and who is available. So maybe a little shame in that respect but not much.	Health/illness of others	Guilt/ Shame
I did feel guilty because when my wife died a few years later I married my wife and we had this kind of problem with her daughter. We had agreed that for any problem we would be resolve it together without involving any other family members. …definitely ashamed and guilty and upset and angry and frustrated at different times, even despaired.	Social/interpersonal arguments	Guilt/ Shame
I felt ashamed that we had not married and then I would have been in a strange position. I felt some guilt as I should have done more and not afraid of what I was witnessing.	Bereavement/death	Guilt/ Shame

Table 6.13 (continued)

Quotes	Life event	SCEs
It is hard to adapt but then I am having this conflicting guilt all the time about the other people out there who are a lot worse than me and they don't have anything to back up. It's that conflicting guilt….	Financial problems	Guilt
I still feel guilty and ashamed. Yes, I do. And I also feel really bad… And I do feel stressed about that. I felt a little guilty when they transferred me from my local hospital to the hospital as I was feeling better after the intravenous steroids and antibiotics… I felt ashamed until I saw my doctor many years later, who told me it is like any other illness that you could take medication for.	Health/illness of self	Guilt/ Shame

6.5 Discussion: quantitative and qualitative findings

This section will interpret the quantitative and qualitative findings in relation to older adults and it will link these findings with the wider literature. Both sources of findings give a new insight and verify the psychological characteristics which enable the distinction between ancient and modern stressors.

The main purpose of this study was to assess the feasibility of distinguishing between ancient and modern stressors and verify the provisional classification based on the psychological stressor characteristics. The characteristics that were found to underlie ancient stressors in older adults were: adaptive coping, past experience, controllability/predictability, short duration, and simple type of stressor. For modern stressors these characteristics were: maladaptive coping, novel experience, unpredictability/uncontrollability, long duration, and complex/multiple stressors. Modern stressors and gender were found to be significant predictors of shame and cold symptoms; and ancient stressors were a significant predictor of guilt. Further analysis showed no moderation effects; no gender differences in coping with ancient stressors; and that older adults reported similar shame and guilt experiences in both ancient and modern stressors. As was the case with study one, ancient and modern stressors cannot be distinguishable by their SCE profile.

6.5.1 Discussion about ancient and modern stressors in relation to shame, guilt and physical health outcomes in older adults

In accordance with hypothesis 1, quantitative findings showed significant positive associations between both ancient and modern stressors with shame. Yet, a significant negative association was found between ancient stressors and guilt. In accordance with hypothesis 2, modern than ancient stressors were associated with

higher levels of cold symptoms. These correlation analyses provided indicative justification to examine these relationships in more depth using multiple regression analyses.

According to the transactional theory of stress and coping, theories of adaptation and SCEs (Lazarus & Folkman, 1984b; Sterling & Eyer, 1988; Tangney & Dearing, 2003), those who are more able to adapt and deal with ancient stressors, experience these life events as less stressful. In accordance with hypothesis 1a, older adults in the current study appear to report high levels of shame associated with modern stressors. In contrast to hypothesis 1b, older adults appear to express low levels of guilt associated with ancient stressors. Female older adults were likely to report higher levels of shame in relation to modern stressors than males (Cahill et al., 2009; Lund et al., 1986; Lyberg et al., 2013); however, further analysis implied that SCEs do not constitute a further characteristic to distinguish between ancient and modern stressors.

These quantitative findings could be interpreted based on the importance of stressors to the individuals' actions, behaviour and self-evaluation (Reisenzein & Hofmann, 1990; Roseman, 1991; Roseman et al., 1990; Siemer et al., 2007; Weiner et al., 1982). Previous research has shown that older adults experience stressful life events in everyday life (Hardy et al., 2002; Moos et al., 2006; Murrel et al., 1984; Norris & Murrell, 1990; Sale et al., 2008; Zautra et al., 1991). The SCEs of shame and guilt have been found to be associated with acute psychosocial life events in older adults (Cahill et al., 2009); more specifically with the ancient-designated stressor of bereavement (Lund et al., 1986) and the modern stressor of personal health problems (Erikson & Erikson, 1998; Erikson, Erikson, & Kivnick, 1994; Lyberg et al., 2013). It is not the stimulus which directly elicits negative SCEs, but instead the way individuals appraise the experience and severity of life events. In this study, older adults were typically able to

deal with ancient stressors (e.g., bereavement) (Aldwin et al., 1996), unless they were less able to regulate negative emotions as well as control and deal with stressful, internal, stable and controllable events. This is the reason why they reported greater guilt for ancient stressors and shame for modern stressors because of maladaptive coping (Tracy & Robins, 2006). Interestingly, shame associated with modern stressors, which were found to be linked with greater HPA axis activity (Schreier & Evans, 2003), might have had implications for health (i.e. cold symptoms) (Miller et al., 2007) depending on the characteristics of those stressors and older adults' perceptions.

The most important quantitative finding of study two, which associates ancient and modern stressors with cold symptoms as theory suggests (McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling & Eyer, 1988), is the positive association between modern stressors and cold symptoms in older adults. In accordance with hypothesis 2b, modern life events were found to be a strong and significant predictor of the severity of cold symptoms while there was no main effect of perceived stress on symptoms. Previous research has shown that the severity of stressful life events better reflects the impact on individuals' health and well-being than the total number of events (Holmes & Rahe, 1967; Kacel et al., 2014; Kendler et al., 2001). Although no measure yet exists with which to directly assess ancient and modern stressor severity per se, that assessed through the psychological stress scales (i.e. LEI) indicating a significant association between modern stressor severity and cold symptoms. Schreier and Evans (2003) also found that exposure to modern stressors was significantly and positively associated with increased cortisol and HPA axis activity, which has implications for poorer health outcomes. Shame associated with chronic stressors (e.g., modern) has been linked with elevated cortisol levels, which might have implications for health (e.g., cold symptoms) (Miller et al., 2007). Individuals who are exposed to long-lasting life event stressors are more likely to develop common cold symptoms (Cohen et al., 1998).

Further to the previous finding, severity of negative life events has been also associated with mental and physical health, well-being and increased cortisol response (de Frias & Whyne, 2015; de Paula Couto et al., 2011; Epel, 2009; Hermans & Evenhuis, 2012; Kahana et al., 2012; Mancini et al., 2011). Compared to ancient stressors, individuals are less able to adapt and deal with modern stressors and may experience greater and prolonged physiological arousal resulting in allostatic load, wear and tear of physiological bodily systems and ill-health (Gross et al., 1997; Leventhal et al., 1998; McEwen, 1998a, 1998b; Schreier & Evans, 2003; Sterling, 2012; Sterling & Eyer, 1988). Thus, older adults are more likely to be susceptible and vulnerable to physical health symptoms (Cohen et al., 2003; Falsey et al., 1997; Falsey & Walsh, 2006; Glei et al., 2007; Holahan et al., 1984), when they experience modern stressors because of their inability to cope with these stressors or because modern stressors impact allostatic systems to a greater degree; and these systems are more vulnerable in older than younger adults also due to immunosenescence (Aw et al., 2007; Bauer, 2013; Miller et al., 2007). However, older adults may be more able to deal with ancient stressors due to their lifetime experience and acquired coping strategies (Aldwin et al., 1996; Perry et al., 2015).

Lastly, this was the first study which examined whether the relationship between ancient and modern stressors and physical health symptoms could be moderated by gender, shame and guilt (Fee & Tangney, 2000; Geisner et al., 2004; Israel-Cohen & Kaplan, 2016; Murray et al., 2000; Romero-Moreno et al., 2013). In contrast to hypothesis 3, no moderation effects were found because of weak or no associations between the stressors and the moderators, which implies a direct effect on this relationship that does not depend on the value of moderators. As has been already discussed in the introduction of this chapter, shame and guilt have been examined previously as moderators but not in the context of stress and physical health. Gender

was also expected not to act as a moderator in the relationship between ancient and modern stressors with physical health outcomes based on the findings from study one. Despite this, gender needed to be examined as moderator in older adults as ancient and modern stressors constitute a novel concept in stress research and because there have been found gender differences in the experience of physical health (Cohen et al., 1999; Macintyre, 1993; Prasad et al., 2000; Van Wijk & Kolk, 1997).

6.5.2 Discussion of the content analysis findings in older adults

According to the main aim of this study, the deductive qualitative content analysis dealt with those life events that were a priori designated as ancient and modern from Schreier and Evans (2003) and were also examined in study one. This approach provided some empirical basis and a defensible and plausible rationale to distinguish between ancient and modern stressors. It also provided some further evidence regarding the provisional stressors' designation that had been made based on the psychological characteristics. Despite this, further research needs to take place in case that there might also be other characteristics that underlie ancient and modern stressors that the current study was unable to identify. In this study, the characteristics provided a clearer and more complete picture of life events that could be regarded from older adults as ancient or more modern across the continuum.

The qualitative findings are also in line with the findings of study one in younger adults. This is the first study which examined the distinction between ancient and modern stressors in an older adult population regarding shame, guilt and cold symptoms. As with study one, the underlying characteristics for ancient stressors were: adaptive coping, past experience, controllability/predictability, short duration and simple type of stressor; and for modern stressors were: maladaptive coping, novelty,

uncontrollability/unpredictability, long duration, complex and multiple stressors. Detailed interpretation of these characteristics has been already discussed (section 5.6.2; Chapter five).

Previous research suggests that older adults may experience fewer life events, appraise them as less stressful, may be more able to regulate negative emotions and be better equipped with coping mechanisms due to their lifetime experience to deal with acute psychosocial stressors than younger adults. From a psychological and even evolutionary perspective, adults are more able to adapt and deal with ancient than modern stressors, which have been an integral part of humans (Aldwin, 1990; Aldwin et al., 1996; Cohen, 1990; Folkman et al., 1987; Goldberg & Comstock, 1980; Masuda & Holmes, 1978; Schreier & Evans, 2003). However, this appears not to be the case regarding more modern stressors for both older and younger adults.

Both studies one and two suggest that adults are less able to adapt and deal with modern stressors. Further to this, specifically in the current study, lifetime experience and acquired coping mechanisms did not enable older adults to deal more efficiently with modern stressors compared to younger adults. No gender differences were also found for older adults in coping strategies with ancient stressors, who used problem and emotion-focused coping. This finding is congruent with Schreier and Evans (2003) that male and female children did not differ in ancient and modern stressors' experience. Interestingly, older adults, compared to younger adults, employed their past experiences to deal with ancient stressors (Perry et al., 2015). As expected, older adults did not indicate any form of coping with modern stressors due to these stressors' characteristics.

Older adults are also able to cope with ancient-designated life events such as health and illness, death and bereavement of close family members and friends through problem and emotion-focused coping (Aldwin et al., 1996; Felton, 1990; Mattlin et al.,

1990; O'Brien & DeLongis, 1996; Patterson et al., 1990). However, these findings contradict previous research that found gender differences in coping with stressful life events and that older adults mainly use passive and emotion-focused coping (Berg & Upchurch, 2007; Diehl et al., 1996; Koenig et al., 1988; Moos et al., 2006). This difference might be interpreted in relation to the purpose of each study, the life events that examined and other variables (e.g., personality traits) that might influence gender differences in coping (Lee & Mason, 2014; Matud, 2004; Tamres et al., 2002). This is the first study which explored older adults' gender differences in coping with ancient and modern stressors.

More modern stressors, which last for a longer period of time (Cheung & Li, 2012), are mismatched with the familiar ancient past of individuals (Tooby & Cosmides, 1990), are unpredictable, uncontrollable (Henry & Grim, 1990; Sapolsky, 1994) and novel (i.e. no previous experience) (Rose, 1980), are more likely to lead individuals to maladaptation (Sklar & Anisman, 1981), increased cortisol responses and prolonged HPA axis activation (Dickerson & Kemeny, 2004), negative health outcomes (Eaton et al., 2002; Trevathan, 2007; Williams & Nesse, 1991) and wear and tear of the physiological/allostatic systems of the body (i.e. allostatic load) (McEwen & Stellar, 1993). This argument considering the underlying psychological characteristics of modern stressors supports the finding of the present study that modern stressors are associated with cold symptoms in older adults.

6.6 Overall discussion

This section aims to integrate and sum the most important quantitative and qualitative findings of study two, as well as to discuss the overall findings from studies

one and two regarding ancient and modern stressors although the literature is quite limited.

The main aim of this research programme is to explore the feasibility of distinguishing between ancient and modern stressors from a psychological perspective. Study one with younger adults and study two with older adults identified five stressor characteristics that underlie ancient and modern stressors: coping, experience, manageability/expectedness, duration, type of stressor. Considering also the a priori designation from Schreier and Evans (2003), the life events of death/bereavement of family member/friend, health/illness of others, and social/interpersonal arguments could be designated as ancient stressors; and the life events of unemployment, financial problems, health/illness of self, and separation/distance could be regarded as more modern stressors. The life event of movement, which had been a priori classified as an ancient stressor (Schreier & Evans, 2003), was regarded as a more modern stressor from both younger and older adults; this stressor therefore requires re-assessment and potential re-designation in future research.

Regarding stressor severity, younger and older adults generally appraised ancient stressors as moderately stressful and modern stressors as very stressful. Previous research suggests that individuals can adapt and deal with ancient stressors, whereas they are less able to deal with modern stressors which might result in prolonged HPA axis activation, wear and tear, allostatic load and ill-health (McEwen, 1998b; McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling, 2012; Sterling & Eyer, 1988). Although studies one and two provided a plausible and defensible justification to designate psychosocial life event stressors as ancient and modern, the underlying psychological stressor characteristics need to be examined in future studies. For example, using an experimental design future research could examine the associations

between life event stressors designated as ancient and modern and ability/inability to cope.

Although studies one and two assessed and found that specific a priori designated life event stressors could be categorised as ancient or modern for these specific sample populations, this programme of research suggests that a stressor moves along a continuum either more on the ancient or modern side (Figure 6.5). The move of a stressor along a continuum/pendulum depends on the stressor's psychological characteristics (i.e. coping, experience, manageability/expectedness, duration, type) and the individual's perceptions/appraisals of the stressor as well as their adaptive/maladaptive coping resources. These factors might determine why a life event stressor could be appraised as either more ancient or more modern by each individual.

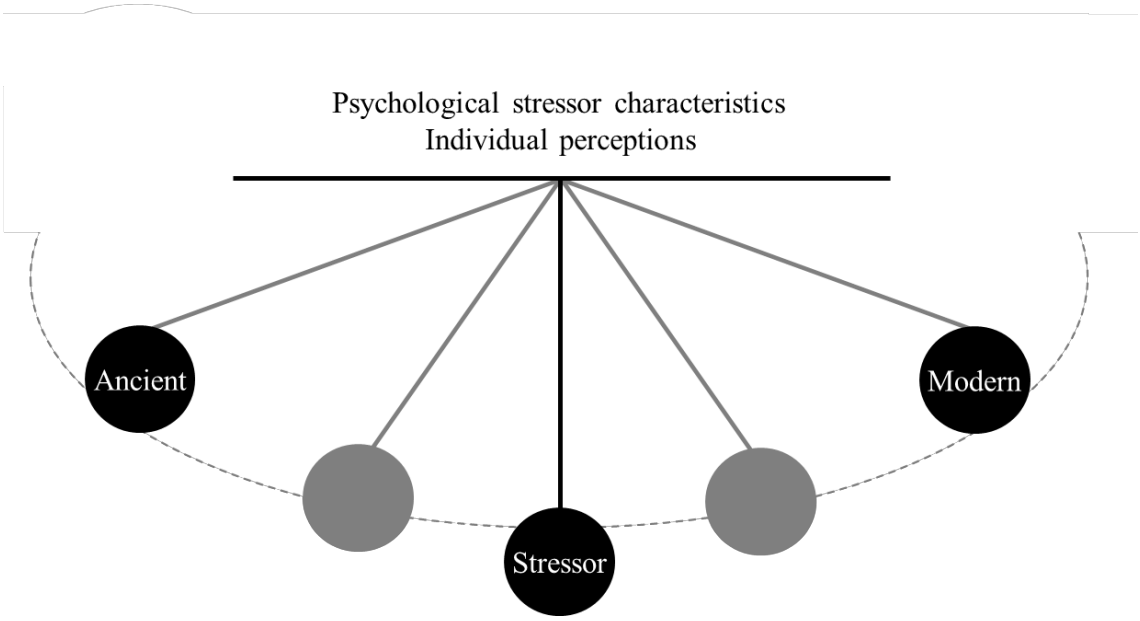

Figure 6.5. Illustration of a stressor moving along an ancient/modern continuum.

Quantitative analyses showed that younger and older women reported shame experiences in both ancient and modern life events. However, qualitative analyses indicated no gender and age differences in SCEs regarding ancient and modern stressors. Older adults are more likely to report guilt and shame than younger, and

women are more likely to experience shame and guilt in stressful life events than men (Orth et al., 2010; Roberts & Goldenberg, 2007; Tangney & Dearing, 2003). Older adults may also be less likely to express shame and guilt compared to younger adults due to their ability and experience to regulate negative emotions (Carstensen et al., 2000; Gross et al., 1997; Henry et al., 2018; Labouvie-Vief et al., 1987; Lawton et al., 1993; Tangney, Miller, et al., 1996). Previous research supports these findings, although studies one and two were the first which examined SCEs in ancient and modern stressors. Negative SCEs were elicited mainly in ancient stressors; a potential explanation is that individuals, who appraise ancient life events as important to their self-evaluation (behaviour and actions), express SCEs as they direct coping towards themselves in order to deal with these stressors (Bulger, 2013; Cosmides & Tooby, 2000; Lazarus, 1991; Lewis, 2011; Miller et al., 2007; Reisenzein & Hofmann, 1990; Roseman, 1991; Roseman et al., 1990; Siemer et al., 2007; Tracy & Robins, 2004; Weiner et al., 1982).

Regarding gender and age differences in coping with ancient and modern stressors, younger and older adults dealt with ancient stressors using problem and emotion-focused coping. Remarkably, older adults compared to younger adults also used past experience as a coping mechanism to deal with life event stressors. Studies one and two were the first which examined coping in particular with ancient and modern stressors. Previous research suggests that older adults are likely to use less effective and passive coping whereas younger adults use more problem-focused coping, and that males and females differ in coping due to different life experiences (Aldwin, 1991; Berg & Upchurch, 2007; Diehl et al., 1996; Folkman et al., 1987; Meeks et al., 1989; Meléndez et al., 2012). The findings of both studies did not confirm these gender and age differences in respect to ancient and modern stressors, but instead both studies

suggested that males and females do not differ in coping mechanisms (Matud, 2004; Tamres et al., 2002).

Modern stressors were found to be significantly associated with cold symptoms in older adults. This is one of the most important findings of this research programme so far because it accords with previous research about the stress and health/illness link (Cohen & Lazarus, 1979; Cohen & Hoberman, 1983; de Frias & Whyne, 2015; de Paula Couto et al., 2011; DeLongis et al., 1982; Epel, 2009; Kahana et al., 2012; Kanner et al., 1981; Lazarus & Folkman, 1984b; Mancini et al., 2011). This finding also extends the existing stress literature suggesting that inability to adapt and non-effective coping with modern stressors make individuals more susceptible and vulnerable to health outcomes and implying high risk of allostatic load (Seeman & Gruenewald, 2006). Future work needs to examine in greater depth the association between ancient and modern stressors with physical health.

6.6.1 Strengths and limitations of study two

The present study has many strengths regarding novelty and innovation because it was the first to investigate associations between ancient and modern stressors with shame, guilt, and cold symptoms in older adults. A thorough mixed-methods approach was employed using a series of self-report questionnaires and semi-structured interviews in order to i) make a distinct classification of life events as ancient and modern stressors; ii) to investigate gender differences in coping and shame and guilt experiences in ancient and modern stressors; and iii) to explore age differences between younger and older adults in the perception of ancient and modern stressors based on psychological characteristics. Ancient and modern stressors and the aforementioned concepts have not been examined before through interviews. This study also benefitted

from the sufficient and satisfactory sample size of 75 older adults recruited to complete the questionnaires and 21 participants interviewed, which created a wealth of rich quantitative and qualitative data. The major strength of this study is the theoretical distinction between ancient and modern stressors and the reasonable conclusions that could be drawn about ancient and modern stressors' perceptions from young to old adulthood.

However, limitations of this study should also be considered. Regarding the practical nature of this study, the participants were recruited entirely from the Bath and North East Somerset area, resulting in a relatively homogeneous sample. Future research would benefit from recruiting adults across the country from several and different academic, professional and social backgrounds in order to explore in even greater depth the stressors' perception (Burroughs et al., 2003; Jackson et al., 1991; Quarterman, 2008). Secondly, although older adults were willing to participate and sometimes not eager to take part into the prize draws, most of the recruiting processes were ineffective except for the in-person invitation. Thirdly, the interviewed participants had been re-contacted approximately six weeks since the completion of the questionnaires and were not interviewed until four weeks later. This long delay made most of the participants need more time to remind themselves of the questionnaire responses and to recall past memories and experiences. Fourthly, although the use of semi-structured interviews was appropriate to explore the research question (Miles & Gilbert, 2005), the long duration of the interviews might have caused fatigue to older adults as a lot of topics were covered in depth. From the researcher's point of view and also considering the feedback, older adults compared to younger adults were more willing to speak clearly and openly, to express directly their emotions and to share their lifetime experiences without hesitation.

Regarding weakness of the research in respect to interpretation, one concerns the age group of participants in this study; 60-75 years. According to Erikson's stages of psychosocial development (Erikson & Erikson, 1998; Erikson et al., 1994) this age group could be regarded 'mature' rather than 'older' adults. However, some gerontologists define older adults as those aged between 60 and 85+ years by further subdividing into sub-categories, such as young-old people (60-69), middle-old (70-79) and very old adults or elders (80+) (Erikson & Erikson, 1998; Forman, Berman, McCabe, Baim, & Wei, 1992; Newman & Newman, 2017). The World Health Organization (WHO) (2017) states that "there is no general agreement on the age at which a person becomes old". As there is a large variation of the theoretical definition of older adults, for the purposes of this study conclusions are drawn specifically for those older adults aged 60-75 years.

Further to this, previous work by Schreier and Evans (2003) found that children's exposure to modern rather than ancient stressors was highly associated with HPA axis activity. Study one in this research programme found that younger adults were less able to adapt and deal with modern than ancient stressors. The current study also showed that older adults were more able to deal with ancient than modern stressors as literature suggests that people as ageing increase their ability to cope due to past experience and lifetime acquired coping skills. Based on these findings and previous research, by looking more closely at age groups and particularly at subgroups from 60 years it would be expected that elderly people will be also more able to deal with ancient stressors than modern as these stressors are matched with the ancestral past. If this is the case, conclusions can be drawn about coping with ancient and modern stressors across adulthood (from young to elderly people), suggesting that regardless of one's age individuals are able to adapt and deal with ancient stressors and less likely to

deal with modern stressors. Such conclusions would enable a better and tighter definition of ancient stressors.

According to previous research including that surrounding the transactional model of stress and coping (Lazarus & Folkman, 1984b), older people deal with stress in a more primitive, innate, normative and mature way. Older adults compared to younger are less likely to perceive stressors as changeable and older men are more likely to use passive coping whereas women active coping (Folkman et al., 1987; Lazarus & DeLongis, 1983). Although it has been found that older adults are more likely to lack control over stressors because of physical weaknesses than younger adults, small age differences have been identified between older and younger adults in coping suggesting that both adult populations employ similar coping strategies (Folkman et al., 1987). Biological ageing might also have an impact on older adults' coping as they may experience poorer health outcomes and age-related stressors (e.g., bereavement) than younger adults (Aldwin, 1991).

In relation to previous research on age, stress and coping and the transactional theory, the aim of the current study could be addressed in a more focused manner by exploring and assessing the ancient and modern stressor distinction in an older adult subgroup attaining a higher age limit. Therefore, it would be expected that elder adults would be more able to adapt and deal with ancient than modern stressors due to lifetime experience and coping skills; age differences would not be found in coping with ancient stressors between elder and younger adults; and also modern stressors would be associated with higher levels of cold symptoms in elderly as being a more vulnerable and susceptible population to physical health than younger adults.

As with study one, the current study did not assess bio-physiological measurements. Based on the theory of allostasis (Sterling & Eyer, 1988), stressors have

implications on the physiological regulation of older adults' allostatic systems (e.g., neuroendocrine, immune, cardiovascular and metabolic systems). The impact of stressors on the wear and tear of allostatic systems make older adults susceptible and vulnerable to physical health symptoms. It would be reasonable to expect that modern stressors will have a greater impact on allostatic systems than ancient stressors resulting in poorer physical health.

Lastly regarding methodology, currently no measure exists to specifically assess ancient and modern stressors, making assessment difficult and rudimentary. Future work including any replication of these studies would benefit from the construction of a dedicated ancient/modern stressors measure. Because there is only one article published about ancient and modern stressors, over-interpretation of the findings should be avoided and discussion should be made based on the existing relevant literature. The current work of this research programme has made advances towards the assessment of a novel concept through incremental steps and devising new methodologies. This work has extended the literature and progressed the development of such a measure by identifying specific life events that have been designated as ancient or modern stressors and psychological characteristics that underlie these stressors.

6.6.2 Conclusions of study two

Study two considered older adults' appraisals and experiences of stress in relation to ancient and modern origins, shame and guilt reported, coping mechanisms, and cold symptoms through mixed methods. Ancient stressors were found to be significantly associated with guilt, and modern life events with shame and physical symptoms. Support for these findings was found in the wider but limited literature and research. No gender differences in SCEs and coping were found, which have been

supported by previous research, and suggest homogeneity in sampled older adults' perceptions of stressors. Qualitative analysis verified the psychological characteristics that were found to underlie ancient and modern stressors providing a distinct designation of specific life event stressors as ancient and modern. Age differences between younger and older adults were also discussed in order to draw potential conclusions about ancient and modern stressors across adulthood. The naturalistic studies conducted so far found some initial findings to initially distinguish between ancient and modern stressors.

Future studies should aim to examine this novel and innovative ancient and modern stressors distinction in an experimental setting. Experimental designs can offer a deeper and different approach to explore and assess ancient and modern stressors as they have been seen as more real, true and accurate measurements from cross-sectional designs. An experimental approach would not only strengthen this distinction, but would also enable the application of explicit psychological characteristics to examine whether individuals could implicitly differentiate ancient from modern stressors. There is a need to move beyond the explicit distinction that was found in studies one and two and to assess the feasibility of implicitly distinguishing between the stressors. Study three aims to do this using a cognitive experimental task: to explore whether ancient and modern stressors associate with the ability/inability to cope at an unconscious, implicit and innate level; as the theory suggests that there are established psychophysiological mechanisms that enable individuals to adapt and deal more efficiently with ancient than modern stressors, since these stressors have been an integral part of human evolutionary history.

Chapter Seven: Study Three

An experimental exploration of the ancient and modern stressor distinction

7.1 Chapter overview

This chapter describes an examination of ancient and modern stressors in adults through a laboratory computer-based study. It employs an experimental design, utilising the implicit association paradigm as applied to ancient and modern stressors. Having established in studies one and two the feasibility of distinguishing between ancient and modern stressors, study three aims to explore whether ancient and modern stressors could be distinguished at a cognitive, unconscious, implicit level. Using a quantitative method, repeated-measures ANCOVA found that adults implicitly were faster and more accurate to associate ancient than modern stressors with ability to cope. This might imply that ancient and modern stressors could be implicitly distinguished.

7.2 Introduction

7.2.1 Moving from the conscious (explicit) to an implicit ancient and modern stressors distinction

The rationale presented so far in this thesis is that established psychophysiological coping mechanisms enable individuals to deal with ancient stressors since these stressors have been an integral part of human evolution; modern stressors have been considered as evolutionarily newer thus people have had less time to adapt and cope, resulting in higher allostatic load and greater impact on physical health (McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling & Eyer, 1988).

Considering this notion, the previous two studies of this research programme, which were conducted with younger and older adults respectively using mixed methods, indicated a distinction between ancient and modern stressors. The feasibility of distinguishing between ancient and modern stressors was based upon the psychological characteristics that were found to underlie these stressors, namely; coping, experience, manageability/expectedness, duration, and type of stressor. The life events that could have been considered as ancient stressors were: bereavement/death of family member/friend, health of others, social/interpersonal arguments and movement. The modern life event stressors were: unemployment, health of self, financial problems and separation/distance. Lastly, in the previous two studies neither gender nor age differences in coping with ancient and modern stressors were found, nor gender moderated the association between ancient and modern stressors with shame, guilt and physical health outcomes. For this reason, although the current study will consider gender and age it will not focus directly on them.

Using the psychological characteristics and the ancient and modern stressors distinction that was developed in studies one and two, study three builds upon these previous findings in order to explore whether adults can implicitly distinguish between ancient and modern stressors. The ancient and modern stressors distinction has not been considered implicitly before and generally implicit measures have been used in research examining sensitive issues (e.g., racism, obesity, political preference) and health issues (e.g., alcohol and smoking addiction, anxiety) (Egloff & Schmukle, 2002; Frantz, Cuddy, Burnett, Ray, & Hart, 2004; Greenwald et al., 2003; Jajodia & Earleywine, 2003).

Before moving forward to the main implicit part, according to the implicit paradigm designs, explicit measures are used in conjunction with implicit measures. In

relation to the current study, an explicit measure in conjunction with an implicit measure will be also employed assessing ancient and modern stressors. The reasons why an explicit measure is used in an implicit paradigm have been outlined by Greenwald et al. (2002). The first reason is in order to obtain a balanced design to explore and examine a concept (i.e. ancient and modern stressors in the current study) both explicitly and implicitly. The second reason is to compare the findings between the explicit and implicit measures. Any similarities between the explicit self-reports and implicit paradigm of the same concept would indicate an experience of personal agreement whereas any discrepancies would show an experience of conflict. Regarding this study, it is expected that the use of an ancient and modern stressors-coping explicit measure in combination with an implicit measure will provide a harmonised design and similar findings between the two measures. Due to the psychological characteristics that underlie ancient stressors (i.e. adaptive coping, past experience, controllability/predictability, short duration, simple stressor), it would be expected that people would be more able to tap into their unconscious, automatic mind and draw established, inherent coping mechanisms to deal with ancient rather than modern stressors (Ghadimi et al., 2018; Leary et al., 2006; MacLean, 1990). The last reason why an explicit measure will be used with an implicit design in this study is in order to assess the ancient and modern stressors distinction that has been identified in the previous two studies. A confirmation of this distinction also in the current study would enable conclusions to be drawn about a conscious (explicit) ancient and modern stressors distinction which will then be extended and explored at an unconscious, implicit level.

7.2.2 The concept of implicit cognition

Implicit cognition consists of lack of awareness, automatic, unconscious and unintentional activation of cognitive systems and predicts behaviours. Explicit cognition involves conscious, deliberate and controllable thoughts and reports (Dovidio, Kawakami, & Beach, 2001; Engelhard, Huijding, Van den Hout, & de Jong, 2007). Through social learning and development, implicit processes are stored in memory and become explicit (Dovidio et al., 2001). Implicit processes involve past experiences which influence individuals' judgements in such a way that they are not introspectively aware of them (Greenwald & Banaji, 1995). Implicit attitudes consist of positive or negative evaluations and preferences for a concept that are less accessible to people's conscious awareness and control, and they are "introspectively unidentified (or inaccurately identified) traces of past experience that mediate favourable or unfavourable feeling, thought, or action toward social objects" (Engelhard et al., 2007; Greenwald & Banaji, 1995, p. 8).

7.2.2.1 The implicit paradigm

One of the most widely used and well-validated implicit experimental tools is the implicit association test (IAT). It measures cognitive unconscious attitudes and beliefs (for example, about age, gender, race) that people may not be willing or able to report. The IAT has been extensively used across many areas of psychology and other disciplines, such as in social, cognitive, clinical, developmental, personality, consumer and health psychology, gerontology, neuroscience, education and even market research (Dovidio et al., 2001; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek et al., 2005). The IAT examines the strength of automatic mental associations between concepts and evaluations or stereotypes using reaction times (RT); however this might

cause discomfort to people as it reveals several aspects of their human nature. It can also disclose introspective past experiences that people avoid to explicitly express because of conflicting with their values and beliefs and having potential negative social consequences (Greenwald & Banaji, 1995; Greenwald et al., 1998; Greenwald et al., 2003). Chee, Sriram, Soon, and Lee (2000) also identified that specific brain regions are activated when an individual performs an IAT. What differentiates the IAT from other implicit measures (e.g., priming tasks) is that it requires an unambiguous categorisation of target items (words, symbols, pictures, acoustic stimuli) to concept categories (Lane et al., 2007; Nosek et al., 2005). Having categorised life event stressors as ancient and modern in the previous two studies and identified psychological characteristics, this implicit paradigm appears to be the most appropriate tool to explore ancient and modern stressors implicitly.

In health psychology research, the IAT has been used to measure individual (and not cultural) attitudes towards smoking (Andrews, Hampson, Greenwald, Gordon, & Widdop, 2010); children's implicit understanding of the stress and health relationship (Cheetham, Turner-Cobb, & Gamble, 2016); preference for a group (e.g., psychology or chemistry) (Nosek, 2005); beliefs, stereotypes or prejudice (e.g., males/females and maths/arts) (Nosek, Banaji, & Greenwald, 2002); gender/ethnic identity and implicit bias (Devos & Banaji, 2005; Greenwald & Farnham, 2000); self-esteem (e.g., self/other and good/bad) (Greenwald & Farnham, 2000); and health-related behaviours (e.g., smoking, alcohol, diet) (Palfai & Ostafin, 2003; Perugini, 2005). It has also been used in conjunction with physiological measures (such as activation of the amygdala and fear towards familiar/unfamiliar black/white faces) (Cunningham et al., 2004; Nosek, 2005; Phelps et al., 2000). As has been already discussed in previous chapters according to the findings of the previous two studies, ancient stressors are associated with the ability to cope and modern stressors with inability to cope. The application of the IAT in the

current study could enable the assessment of adults' evaluations towards a concept; specifically, to explore mental associations between coping and ancient and modern stressors (e.g., ability/inability to cope and ancient/modern stressors).

The stressors-coping concept will be examined based on the notion of ancient stressors/ability to cope and modern/inability to cope, as such Nosek et al. (2002) examined the belief of males/maths and females/arts association concepts. They assessed the explicit belief/stereotype and found that males would implicitly prefer maths and females would prefer arts. According to this implicit study and ancient and modern stressors theory (McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling & Eyer, 1988), it is expected that individuals would show a stronger preference to associate ancient stressors with ability to cope than modern stressors with inability to cope.

7.2.2.1.1 The IAT in stress research

Although the application of IAT measure in stress research has not been extensive and has been mainly around anxiety and psychophysiology, the work that has been done is important. A study by Sato and Kawahara (2012) measured acute stress, anxiety and self-esteem using an IAT in 55 young adults (*M*age = 23.00) to obtain an objective assessment of acute stress free of social desirability. They found that people in the high-stress group, compared to those in the low-stress group, associated themselves with greater anxiety when participants were exposed to a manipulation anxiety test and threat of self-esteem. They concluded that the IAT can be sensitive when examining temporary changes between stress and self-esteem but it is still more useful than self-reports.

However Schmukle and Egloff (2004), who measured implicit and explicit anxiety and assessed personality dispositions in 185 young adults (*M*age = 24.00), did not find an implicit effect on explicit state anxiety using an IAT; in this study participants had explicitly expressed stress through a public speaking test. Egloff and Schmukle (2003) had also found that social desirability did not moderate the relationship between implicit and explicit anxiety measures, but instead it might have moderated the relationship of other social constructs (e.g., prejudice or racism towards minorities) or there might have been other moderators in the construct of anxiety (e.g., motivation or ability to control anxiety, self-presentation or attitude collaboration) (Nosek & Banaji, 2002).

Another study from Egloff and Schmukle (2004) examined gender differences in anxiety for personality traits assessment by categorising self stimuli with anxiety/calmness words (Egloff, Schwerdtfeger, & Schmukle, 2005; Schmukle & Egloff, 2004). Women explicitly and implicitly scored higher in anxiety than men; implicit and explicit measures were not significantly associated. Verkuil, Brosschot, and Thayer (2014) found that implicit anxiety was associated with greater levels of heart rate in 41 young women (*M*age = 22.40) due to the experience of an acute stressor and regardless of explicit anxiety. In relation to the studies that have been discussed so far, previous research used the IAT in order to examine and verify or refute explicit findings. For example, the implicit findings from Egloff and Schmukle (2004) verified previous explicit findings that women are more likely to express greater anxiety implicitly and explicitly than men, whereas the implicit findings from Schmukle and Egloff (2004) did not confirm the explicit anxiety findings. Therefore, the use of IAT in the current study of this research programme will help to confirm or refute the ancient and modern stressors distinction by examining the associations between coping and stressors.

Brosschot, Verkuil, and Thayer (2010) argued that prolonged physiological stress response due to acute stressors can be identified both explicitly and implicitly; individuals continuously think and mentally represent the stressors before, after or during the anticipation of them to occur. Continuous, frequent or spontaneous cognitive thinking of stressors' representations prolongs this physiological activity. It is not the actual stressors that cause physical damage and allostatic load but instead the cognitive and ruminative representation of those stressors, which activate the fight-flight and all the relevant stress-coping responses in order to decrease physiological activity (Brosschot, Pieper, & Thayer, 2005; Brosschot, van Dijk, & Thayer, 2002; Ursin & Eriksen, 2004).

According to the theory around ancient and modern stressors, and having established the psychological stressor characteristics in the previous two studies and the validity of the ancient and modern stressors distinction, it is reasonable for the current study to explore the feasibility of implicitly distinguishing between these stressors. Previous literature asked participants to associate self/others with anxiety/calmness stimuli whereas the current study will explore the association between ancient and modern stressors with coping aiming to assess whether the findings of the previous two studies could be confirmed using an implicit paradigm.

7.2.2.2 Implicit versus explicit measures and their relationship

The IAT has been regarded as an authentic and accurate measure of associations than self-reports exploring individual automatic processes that are introspectively inaccessible. It also better identifies psychological associations and outcomes due to its greater predictive validity, compared to self-reports, removing the extraneous factor of self-presentation concern. A meta-analysis by Greenwald, Poehlman, Uhlmann, and

Banaji (2009) argues that some researchers do not support this position, arguing instead that both measures are real and can be used in different ways as well as combined (Lane et al., 2007; Nosek et al., 2005). There are three pillars that differentiate implicit from explicit measures: the first is that people might not be aware of unconscious associations and introspectively produce explicit associations. The second differentiation is that individuals might be aware of implicit associations but do not accept them because those associations contradict their beliefs and thus they support explicit associations. The third is that people might be aware of implicit associations but choose an explicit association because of their concern that an implicit association would not be socially acceptable (Nosek et al., 2005). In relation to these differentiations between implicit and explicit associations, the current study is more closely related to the first rather than the latter two. In this study, individuals, who are likely not aware of unconscious associations between ancient and modern stressors with coping as this concept is novel, are more likely to introspectively produce explicit associations between ancient stressors and coping according to the findings of the previous two studies and the psychological characteristics that underlie those stressors.

Given the work in psychology, associations between implicit and explicit processes are sparse because the implicit constructs may be distinct from the equivalent constructs of self-reports. Implicit and explicit measures involve different processes and thus are not necessarily expected to be empirically related. Unconscious processes that are culturally and socially learnt and automatically activated may not be associated with personal beliefs that are expressed in self-reports (Dovidio et al., 2001).

Greenwald et al. (1998) emphasized that implicit and explicit measures are distinct, divergent and separate and found weak to absent associations between them; weak correlations do not reflect weaknesses though but instead represent the nature of

measures. Other research has found stronger associations as both measures might be moderated by several interpersonal and intrapersonal aspects of attitudes (Greenwald & Nosek, 2001; Greenwald et al., 2003; Greenwald et al., 2009; Nosek et al., 2005). Previous studies demonstrate a wide variation in the implicit-explicit correlational findings. Lane et al. (2007) stated that across 17 IAT and laboratory studies the implicit-explicit correlation varied from r = .13 to .75 showing weak to moderate positive associations. In socially sensitive topics (e.g., racism), correlations were weak and negative (Dovidio et al., 2001). Implicit and explicit measures of anxiety that have not been correlated at a significance level indicated weak correlations ranging from r = -.06 to .24 (Egloff & Schmukle, 2002; Schnabel, Banse, & Asendorpf, 2006). A more recent meta-analysis in 126 IAT studies showed that correlations varied from r = -.25 to .60, on average r = .19 (Hofmann et al., 2005).

This correlational variation can be due to: the strength and dimensions of attitudes (liking for a category implies disliking for the other category) and attitude distinctiveness (one's attitude is different from others) (Lane et al., 2007); inconsistency between measures which is relatively common (Hofmann et al., 2005); and homogenous attitudes in populations (Dovidio et al., 2001; Greenwald & Nosek, 2001).

Additionally, Hofmann et al. (2005) presented several reasons why low correlations between implicit and explicit measures might exist. First, because of individuals' self-presentation and social desirability concerns in self-reports but unbiased motivational effects in implicit measures (Egloff & Schmukle, 2003). Second, because of the lack of introspection to implicit representations. Third, several factors are required to recall information from memory; implicit representations are automatically activated by a relevant stimulus whereas explicit representations are activated by the

lack of cognitive motivation to deliberately recall more recent information from memory (Dovidio et al., 2001).

Fourth, due to methodological-related characteristics (e.g., order of measures, blocks and IAT trials, age, previous IAT experience, counterbalance, fixed or random stimuli presentation, individual differences, cognitive fluency, and if the explicit measure is indirectly than directly related to implicit representations that examined) (Dovidio et al., 2001; Greenwald & Nosek, 2001). Fifth, introspective limits (ability) and response factors (willingness) such as faking and social desirability lead people not to report accurately and truly on explicit measures (Egloff & Schmukle, 2002, 2003, 2004; Schnabel et al., 2006). Faking/fakeability is another concern and cannot be easily detected; it refers to whether participants have understood the role and purpose of the study and intentionally slow down their response speed (Fiedler, Messner, & Bluemke, 2006). Sixth, individuals might hold different implicit and explicit attitudes (Bassett & Dabbs, 2003). Lastly, due to the two measures having distinct characteristics and being completely independent.

Nosek et al. (2005) also examined 126 studies with a mean effect size of .24 and suggested that the implicit-explicit correlation can be increased through first the spontaneous response to self-reports; second the conceptual connection between the measures; and third the presentation of self-reports before the IAT. With regard to the third parameter the correlational difference was small between presentation of self-reports/IAT and presentation of IAT/self-reports. According to Egloff and Schmukle (2003), correlations between implicit and explicit measures of the same construct are low. To sum, Hofmann et al. (2005) emphasised the content of measures (e.g., racial attitudes) which elicited weak associations whereas Nosek et al. (2002) focused on attitudes across several domains which showed moderate to substantial associations.

Regarding the current study, associations between the explicit and implicit measures will be examined. However, these associations are expected to be weak based on the variation on findings of previous research that has been discussed; due to the fact that the respective contents of both measures may not match as this is the first study to examine ancient and modern stressors; and because there is no true explicit self-report measure for ancient and modern stressors. In addition, if the information drawn from the IAT is unconscious and out of one's introspective control, their association with self-reports may be low (Gawronski, Hofmann, & Wilbur, 2006; Hofmann et al., 2005). For example in the current study, if ancient and modern stressors from the IAT were unconscious, their correspondence to self-reports would be low implying that this concept is out of individuals' control and awareness.

7.2.2.3 Criticism of IAT

The IAT has been criticised regarding its psychometric criteria such as sensitivity to known influences, implicit-explicit correlations, internal consistency, test-retest reliability and resistance to extraneous factors (e.g., mean response latency, IAT order and experience) (Dovidio et al., 2001; Fiedler et al., 2006; Greenwald & Nosek, 2001; Nosek et al., 2005). It has been characterised as a relative and not absolute measure, which implies cognitive judgements whereas self-reports affective judgements. It constitutes an indirect measure of associations which therefore needs a testable direct model as a basis. Although it indicates a good construct and predictive validity– with a few issues to emerge when it is moderated by extraneous factors –it has been suggested to be used as a complementary but different tool from self-reports (Fiedler et al., 2006; Greenwald & Nosek, 2001; Greenwald et al., 2009; Nosek et al., 2005).

In order to overcome these issues, research has shown that a stronger construct validity can be achieved using stimuli that best represent what is examined than a greater variety of low-quality stimuli (Lane et al., 2007). Nosek et al. (2005) stated that sorting IAT trials into subsets (i.e. single-category attitudes; e.g., Me/Good and Me/Bad) does not show conceptually distinct measures. They also found evidence to support that valid IAT measures can be generated using only two to four stimulus exemplars per category; the order of measures does not change the psychometric properties for either measure and has no to little effect on the outcome which contradicts the finding from Hofmann et al. (2005); and using extra practice trials to the reversed pairing block may reduce the effect of IAT critical blocks (Nosek et al., 2005).

Additionally, Fiedler et al. (2006) stated that several uncontrolled factors and practical issues can strengthen or reduce the significance of IAT effects, such as possible cross-category associations of both target and attribute stimuli; what is tested; how it is interpreted; how the association is assessed; and what the measurement procedure is. In the conventional IAT, for example, older individuals showed larger IAT effects than younger individuals, previous IAT experience revealed smaller effects in repeated sessions, and gender differences were trivial. These extraneous factors had been considered and attempts were made to be corrected in the improved IAT (Greenwald et al., 2003; Nosek et al., 2002; Nosek et al., 2005).

The current study took into account this criticism and aims to use IAT as an additional but different tool from self-reports in order to explore the distinction between ancient and modern stressors. This study will attempt to use the best available and unique stimuli to examine ancient and modern stressors and coping and these stimuli will be assessed through inter-rater reliability agreement. It will also use a greater number of stimulus exemplars per category rather than only four stimuli per category as

this is the first study to examine stressors and coping in an IAT, and it will not add any extra practice trials to the reversed pairing block. Lastly in terms of practicality, this study takes into account several extraneous factors that could influence the IAT effects such as the measurement procedure, previous IAT experience and order of blocks utilising the improved IAT in conjunction with the conventional.

7.2.3 Aims of study

The main aim of the third study was to explore adults' unconscious distinction between ancient and modern stressors. Analysis of variance (ANOVA) was used to examine both the explicit and implicit associations and differences between ancient and modern stressors and coping. The purpose of this analysis was to answer the following research question: Are ancient and modern stressors implicitly distinguishable? Considering the underlying psychological stressor characteristics found in previous studies, this experimental study aims to verify the conscious (explicit) distinction between ancient and modern stressors, whilst investigating this distinction at a cognitive, implicit and unconscious level.

7.2.4 Hypotheses of study three

In order to examine explicit and implicit associations and differences between ancient and modern stressors and coping, the following hypotheses were tested. In each case, the variables of gender and age were used as covariates.

1. There will be an explicit distinction between ancient and modern stressors.

    1a. There will be weak association between explicit and implicit measures

(direction of effect not hypothesised).

2. There will be an implicit distinction between ancient and modern stressors.

2a. There will be faster RT for adults who implicitly associate consistent pairs (ancient stressors/ability to cope; modern stressors/inability to cope) than inconsistent pairs (ancient stressors/inability to cope; modern stressors/ability to cope).

2b. There will be greater accuracy for adults who implicitly associate consistent pairs than inconsistent pairs.

2c. Adults overall will implicitly indicate a stronger preference for consistent than inconsistent pairs (utilising the improved IAT *D* scoring algorithm).

7.3 Method

7.3.1 Design

A quantitative (computer-based experimental) design was selected for study three using a repeated-measures ANCOVA to compare RT and accuracy for consistent and inconsistent pair responses. Quantitative research methods were employed to gather and analyse the data, firstly through an implicit measure (i.e. the IAT) (Greenwald et al., 1998; Greenwald et al., 2003) and secondly via an explicit self-report questionnaire. The computer-based task was used to assess adults' implicit understanding and the questionnaire to explore their explicit understanding about the distinction between ancient and modern stressors.

7.3.2 Participants and recruitment

One hundred participant adults (75 females) were recruited from the Bath area of the south west of England to participate in this study. Socio-demographic details were completed and reported (Table 7.1). Based on a power analysis with an estimated medium effect size of 0.15, power of 0.80 and alpha of 0.05, a sample size of 90 participants was required (Cohen, 1992) to enable meaningful quantitative analyses. The participation response rate was 87%; 115 adults were invited and 100 consented to participate. The in-person invitation (n = 45, 45% of the sample), flyer advertisement (n = 35, 35% of the sample) and the University of Bath electronic noticeboard (n = 15, 15% of the sample) were the most successful recruitment methods attracting the majority of the participants.

Table 7.1

Participant socio-demographic information (N = 100)

		Mean	*SD*	Range
Age (in years)		28.27	10.02	18-58
			n	%
Ethnicity	White/Caucasian		76	76
	Black/African/Caribbean		1	1
	Asian/Pacific		21	21
	Mixed		2	2
Marital status	Single		36	36
	In a relationship		35	35
	Engaged		4	4
	Married		23	23
	Divorced/Separated		2	2
Academic status	No schooling completed		2	2
	(Upper) Secondary education graduate		21	21
	Sixth form college		5	5
	Bachelor's degree		36	36
	Master's degree		26	26
	Doctorate/Professional degree		10	10
Employment status	Full-time student		38	38
	Full-time employed		36	36
	Part-time student		11	11
	Part-time employed		11	11
	Self-employed		4	4

7.3.3 Measures

7.3.3.1 Explicit measure: Ancient and modern stressors

Explicit understanding of the ancient and modern stressors was assessed through the Life Events Inventory (Tennant & Andrews, 1976) to examine adults' prior everyday life event stress (see section 4.3.3.1.1; Chapter four). The modified questionnaire consisted of 15 life event items, which had been identified as ancient or modern stressors based on a combined evaluation of Schreier and Evans (2003) and previous two studies' findings. Participants were also asked to describe how they dealt with life events or how they would cope regardless of if they had experienced the stressor before or not. All items were rated on an 8-point Likert scale; 0 (*not happened*), 1 (*happened; not at all stressful*), 4 (*happened; moderately stressful*), 7 (*happened; extremely stressful*). Coping was not measured through the 8-point Likert scale but instead participants used an open text box to describe how they would or did deal with life event stressors; these coping descriptions were transformed into quantifiable variables as described below. For this study, the modified 15-item scale indicated an acceptable good level of internal consistency with the specific sample (Cronbach's α = .71).

7.3.3.1.1 Dealing with the explicit measure

The explicit ancient and modern stressors consisted of nine ancient life event stressors and six modern stressors. As with the previous two studies, the total number and mean severity of ancient and modern stressors were also computed.

In addition, for each item, participants were asked to indicate how stressful the life event was for them if they had experienced it before (based on the 1-7 Likert scale

that was described in the previous section) and to describe how they dealt with it. Participants, who rated life events as 0 (not happened/not experienced before), were also asked to describe how they would deal with those life events.

Based on these descriptions, two new quantitative categorical variables were created for each participant; a variable for the nine ancient stressors ('Ancient_Coping') and a variable for the six modern stressors ('Modern_Coping'). These two new variables were coded as 0 (inability to cope; if the participant did not describe how they did/would deal with the life event) and 1 (ability to cope; if the participant described how they did/would deal with the life event) and were used to test hypothesis 1. As defined (see table 5.5; Chapter five) and described in chapters five and six, any form of adaptive coping (i.e. problem and emotion-focused, and meaning-based coping) was coded as 1. For each new variable, all scores (0 and 1) for each participant were summed up and divided by nine for ancient stressors and six for modern stressors. An average score of 0 indicated inability to cope and an average score of 1 indicated ability to cope. Scores lower than 0.5 rounded down to 0, and scores higher than 0.5 rounded up to 1.

From these two variables, a new categorical variable ('Ancient_Modern_Distinction') was created and coded as 0 (no distinction between ancient and modern stressors) and 1 (distinction between ancient and modern stressors). This variable was used to test hypothesis 2c. The 'Ancient_Modern_Distinction' variable was created based on: if participants had indicated inability or ability to cope in the previous two variables ('Ancient_Coping'; 'Modern_Coping'), this might have implied they were not able to distinguish between ancient and modern stressors. For example, a participant with a calculation of 0 in 'Ancient_Coping' and 0 in 'Modern_Coping' was assigned with 0 in 'Ancient_Modern_Distinction' variable.

Similarly, a participant with a calculation of 1 in 'Ancient_Coping' and 1 in 'Modern_Coping' was assigned with 0 in 'Ancient_Modern_Distinction' variable. Both cases indicated that participants were not able to distinguish between ancient and modern stressors according to their ability/inability to cope. If participants had indicated ability to cope in just one of these two variables (this variable needed to be an ancient life event stressor), this might have implied that they were able to distinguish between ancient and modern stressors (coded as 1).

Lastly, two new quantitative categorical variables were created for each participant; a variable for the nine ancient ('Ancient_Coping_Experience') and a variable for the six modern stressors ('Modern_Coping_Experience'). These two new variables were coded as 1 (experienced and ability to cope; if the participant had previously experienced and dealt with the stressor); 2 (not experienced and ability to cope); 3 (experienced and inability to cope); and 4 (not experienced and inability to cope; if the participant had not previously experienced and did not describe how they did/would deal with the stressor). These variables were also used to test hypothesis 1 as it incorporates the psychological characteristic of experience. As described above, for each new variable all scores (1 to 4) for each participant were summed up and divided by nine for ancient stressors and six for modern stressors computing average scores. An average score of 1 indicated previous experience and ability to cope; an average score of 2 indicated no previous experience and ability to cope; an average score of 3 indicated previous experience and inability to cope; and an average score of 4 indicated no previous experience and inability to cope.

7.3.3.2 IAT

The implicit association between ancient and modern stressors and coping was measured using a modified IAT version adapted from the original IAT version (Greenwald et al., 1998). The IAT is a computer-based task that measures RT to stimulus items. Participants had to sort the stimulus items into one of four categories using two response buttons (where each response button corresponds to two categories). This allows researchers to examine associations between a target and an attribute concept by measuring whether people are faster to respond when consistent/associated or inconsistent/unassociated pairs are paired on the same response button. Faster RT indicate a stronger link between concept and attribute. A meta-analysis of the IAT predictive validity found it to be a better predictor of attitudes than explicit measures (r = .25 and r = .13, respectively) (Greenwald et al., 2009). Additionally, internal consistency (Cronbach's α) for IAT, compared to other latency-based measures, has been found to range from .7 to .9 (Greenwald & Nosek, 2001; Lane et al., 2007; Schmukle & Egloff, 2004).

7.3.4 Procedure

The completion of both the implicit and explicit measures lasted about 45 minutes. Participants in the present study were first presented with the IAT and then with the explicit self-report questionnaire. The IAT typically involves 180 trials (Greenwald et al., 2003). As the current study was the first to examine ancient and modern stressors using IAT, it employed 208 trials in total (96 of which were critical trials) with an intertrial interval of 400 milliseconds (ms) in order to provide participants with the most appropriate stimuli that represented ancient and modern stressors and coping. In IAT, a trial is the presentation of a single stimulus (image or word) that needs

to be categorised. The stimuli presented in the IAT were a combination of images and words that were presented in the centre of the computer screen and were related to the four target concept categories of: 'old problems' (ancient stressors), 'new problems' (modern stressors), 'having sufficient resources' (ability to cope) and 'not having sufficient resources' (inability to cope).

Stimulus images (all coloured and non-cartoon) for the stressors were selected from a combination of copyright-free image websites (iStock, Flickr, Pixabay). Stimulus words for coping were selected from the Oxford English Dictionary and from interviewed participants' transcripts from studies one and two. The IAT scores should not be influenced by familiarity with the items to be sorted out; for this reason, the stimuli should be almost unfamiliar to everyone although people tend to like things they are familiar with and avoid things they do not like (i.e. implicit bias). Implicit bias (or preference for an in-group) might be a product of cultural environment regardless of belonging to that group. In relation to the current study, the chosen stimuli were almost unfamiliar to participants and implicit bias was not regarded as an issue as this study did not examine preferences for in-groups (Lane et al., 2007; Nosek, 2005).

During material preparation and selection, six participants from studies one and two independently coded, rated and verified the choice of pictures and words prior to testing. A total of 38 words and 38 images were collected and rated by seven Health Psychology researchers for how strongly they were associated with the four target concepts. The highest rated 24 images and 24 words were used as stimulus items (12 words and 12 images per category) (see Appendix G). A pilot study, as recommended in Lane et al. (2007), was conducted with the 10% of the total sample (n = 10) to judge the appropriateness of stimuli and RT and accuracy data were analysed via paired-samples t-tests (see section 7.4.2.1.1).

IAT performance is measured by response latency (the speed of the response or RT) and response accuracy (whether the responses were correct or incorrect) to each stimulus item. Accuracy of responses to each stimulus were recorded by ePrime and coded as 0 and 1 for incorrect/inaccurate response and correct/accurate response respectively. Accuracy of responses refers to how many trials participants responded to correctly; the closer the mean score is to 1 the more correct responses were, the closer it is to 0 the more incorrect responses were. A mean score for accuracy of responses for consistent and inconsistent pairs was calculated for each participant. Additionally, a faster RT to the associated pairs than to unassociated pairs would indicate a higher level of understanding of the link between ancient stressors and coping, and modern stressors and non-coping (the associated concepts).

A computer running ePrime Professional 2.0 was used to display the stimuli and participants responded using a response button (only two response keys were needed). Stimulus items were presented in a random order generated by ePrime and each item was presented once. The 48 stimulus items in the IAT were presented in seven blocks: Blocks 1 and 5 contained the 24 ancient and modern stressors images, block 2 contained the 24 ability to cope/inability to cope words, and critical blocks 4 and 7 included all 48 items. Only two categories were shown in blocks 1, 2 and 5; therefore, each response button corresponded to one category. Conversely, in blocks 4 and 7 four categories were shown, two categories per response button. Prior to the critical blocks 4 and 7, practice blocks 3 and 6 included 20 practice trials each (Greenwald et al., 2003).

The purpose of these two critical blocks is to explore and test implicit understanding of the ancient and modern stressors-coping relationship when the two concepts ancient stressors/ability to cope and modern stressors/inability to cope are paired together (associated/consistent pairs) or conversely paired

(unassociated/inconsistent pairs). In the consistent block 4, the categories ancient stressors and ability to cope were shown on the same side of the screen and shared a response button, and the categories of modern stressors and inability to cope were shown on the other side of the screen and also shared a response button. In the inconsistent block 7, modern stressors and ability to cope were paired together and ancient stressors and inability to cope were paired.

All instructions were given on screen and during all seven blocks a notice of 'Press the e key for' and 'Press the i key for' with the two/four categories remained on the screen as a reminder to participants as to which button corresponds to which category. Two response buttons each corresponded to a category: the left 'e' button to the category on the left side and the right 'i' button to the category on the right. The participants used these response buttons to indicate which category the stimulus word/image belonged to. In standard IAT procedure, if a participant gives an incorrect response they see an error message and are required to press the correct button to continue to the next trial. In the current study, although the participants saw an error message, they moved straight on the next trial. Participants might have been disinterested if they had to redo every incorrect trial making also the testing last longer.

Counterbalancing ensured that half the participants were randomly allocated the associated pairs first (order A) and half were presented with the unassociated pairs first (order B) (Cvencek, Greenwald, & Meltzoff, 2011). The order in which an individual takes the test has some influence on the overall results, however the difference is small (Greenwald et al., 1998). The ancient and modern stressors categories alternated between the left and right position on the screen (blocks 1 and 5) in order to minimise the effects of practice whereas the coping and non-coping categories remained unchanged throughout the task, to cause minimal confusion to participants (Table 7.2).

A potential outcome of not alternating the coping and non-coping categories could be faster RT when using one's dominant hand to respond, however Nosek et al. (2005) stated that left/right handedness, hand-eye coordination or cognitive ability had no impact on IAT effects. The IAT score depends upon how long it takes a person typically to categorise the stimuli in the fourth versus the seventh part. The order of implicit and explicit measures has also no impact on IAT (Nosek et al., 2005). To ensure that the present IAT met the assumption that the order in which the blocks were presented to participants had no significant effect on RT and accuracy, independent *t*-tests were administered (see section 7.4.2.1 for findings).

7.3.5 Ethical considerations

The present study was granted full ethical approval from the ethics committee at Departmental level as required by the University and was in line with BPS ethical guidelines (2009) on 1st August 2017 (ethics reference number: 17-202). Participants excluded were those aged under 18 years; those suffering from any stress-related condition as far as they were aware; and those having no uncorrected visual abnormalities (e.g., colour blindness). The researcher ensured that the images used did not induce any form of stress but instead represented life events that one might have or have not experienced and seen in their lifetime.

Table 7.2

Sequence of trial blocks in the ancient and modern stressors IAT

Block	No. of trials	Function	Items assigned to left-key response	Items assigned to right-key response
1	24	Practice	Old problems images	New problems images
2	24	Practice	Having sufficient resources words	Not having sufficient resources words
3	20	Practice	Old problems images + Having sufficient resources words	New problems images + Not having sufficient resources words
4	48	Test	Old problems images + Having sufficient resources words	New problems images + Not having sufficient resources words
5	24	Practice	New problems images	Old problems images
6	20	Practice	New problems images + Having sufficient resources words	Old problems images + Not having sufficient resources words
7	48	Test	New problems images + Having sufficient resources words	Old problems images + Not having sufficient resources words

Note. For half the subjects the position of Blocks 1, 3 and 4 are switched with those of Blocks 5, 6 and 7. The procedure in Blocks 3, 4, 6 and 7 is to alternate trials that present either an ability or inability to cope word with trials that presented either an ancient or modern stressor image. These strategies were successfully used to reduce the typical effect of order in which the two combined tasks are performed.

7.3.6 Statistical analysis

The explicit measure analysis needs to precede the implicit analysis in order to also assess in the current study the feasibility of distinguishing between ancient and modern stressors at a conscious, explicit level. To test for explicit associations, participants' descriptions for ability or inability to cope with stressors were dichotomously coded as 1 and 0 respectively, as explained in section 7.3.3.1.1. These

explicit associations were tested through chi-square test, and the distinction between ancient and modern stressors in relation to total number and severity were tested through paired samples *t*-tests (section 7.4.2.2). To test for implicit associations, RT and accuracy of responses to each stimulus were used for statistical analysis. The RT data were analysed according to the scoring algorithm created by Greenwald et al. (1998).

To address hypothesis 2a, a repeated-measures ANCOVA was used to compare RT for consistent and inconsistent pair responses. To address hypothesis 2b, a repeated-measures ANCOVA was also used to compare accuracy for consistent and inconsistent pair responses. In both hypotheses, gender and age were used as covariates; consistent and inconsistent pairs were the independent variables; and RT and accuracy scores were the dependent variables respectively. Additionally, the data were also analysed through univariate ANOVA using a more currently accepted scoring algorithm which calculates *D* scores rather than RT scores (Greenwald et al., 2003).

This additional *D* score analysis is presented for consistency and comparison with the conventional measure, although it is treated with caution in interpretation because potential previous experience with IAT might influence the results; prior IAT experience has not been totally resolved by the new algorithm (Greenwald et al., 2003). Whilst power in this study was sufficient to satisfy the requirements of the *D* score calculation, the hypotheses for this study focus on speed and accuracy of response to consistent and inconsistent concepts and hence it is appropriate to place more weight on the RT data.

The new *D* algorithm differs from the previous conventional algorithm in relation to which extreme values were deleted; in the conventional algorithm, RT scores were eliminated or recoded if they were outside the range of 300-3,000 ms. However the new algorithm eliminates scores outside the range of 300-10,000 ms and participants

who have more than 10% of trials with a latency of <300 ms making this method more inclusive and the RT method more stringent. It also considers the use of practice-block data and error penalties, and individual standard deviations. Additionally, as participants could proceed to the next trial following an incorrect response, the mean latency of correct responses was computed for Blocks 3, 4, 6 and 7, and each error latency was replaced with the block mean +600 ms error penalty (Greenwald et al., 2003) (Appendix H). Cvencek et al. (2011) excluded participants based on the above criteria and also those who had an error rate of 35% or above. There were no participants in the present study who scored over this level of errors and so all were included in the analysis. To obtain the *D* score, the response latency and accuracy data for each participant were transformed into *D* scores using the improved IAT scoring algorithm. *D* scores represent the difference between the RT scores for consistent and inconsistent pairs and the variance of the within-blocks latencies (i.e. measurement error). A positive *D* score suggests an implicit preference for the consistent pairs (equivalent to a faster RT and greater accuracy to those pairs) (i.e. ancient stressors/ability to cope; modern stressors/inability to cope) and a negative score indicates a preference for the inconsistent pairs.

In the current study, the independent variables were compatible and incompatible pairs, total number and mean severity of ancient and modern stressors, and explicit variables. The dependent variables were RT, accuracy and *D* scores.

7.4 Results

7.4.1 Data screening

Prior to conducting ANOVAs, data screening tested the relevant assumptions of: the dependent variables were measured at the interval or ratio level (i.e. scale data); the

independent variable of pairs consisted of two categorical, independent groups (i.e. consistent/inconsistent); no significant outliers; independence of observations (i.e. no relationship between the observations in each group or between the groups); approximate normal distribution of the dependent variables in the two independent groups; and homogeneity of variance (i.e.sphericity). An outlier was identified in mean severity of ancient stressors being outside the range of ±3.29; mean substitution to the next lowest value/score was used (Dancey & Reidy, 2011; Field, 2013; Ghasemi & Zahediasl, 2012; Hair et al., 2010; Tabachnick & Fidell, 2007).

7.4.2 Descriptive statistics

The summary statistics, including the mean, standard deviation and range (minimum-maximum) of the variables of interest are presented in Table 7.3. Adults responded faster and more accurately to consistent than inconsistent pairs. The means showed that adults coped with more ancient than modern stressors, and they found modern stressors more stressful/severe than ancient stressors.

7.4.2.1 IAT assumptions: Order effect, reliability and validity

In order to test the assumption of IAT blocks order, independent *t*-tests showed no significant effect of order on RT to consistent ($p = .684$) or inconsistent pairs ($p = .678$), and on accuracy to consistent ($p = .425$) or inconsistent pairs ($p = .204$).

The version of the IAT used in the present study met the criteria for internal validity (Nosek et al., 2005; Schnabel et al., 2006). Internal validity can be ensured as long as it is unambiguous which stimulus items belong to each category, the presentation of stimulus items is random, and the consistent and inconsistent blocks are

counterbalanced. IAT has rarely been used previously to examine stress concepts and this is the first use of the IAT to assess ancient and modern stressors-coping associations and understanding. The categories of ancient and modern stressors, and ability and inability to cope were clear and unambiguous.

The overall criterion of agreement/consensus on the stimuli's association with the four target concepts showed a substantial inter-rater reliability agreement, $\kappa = .71$, $p < .001$, 95% CI [.664, .762] (Altman, 1990; Fleiss et al., 2003; Landis & Koch, 1977).

7.4.2.1.1 Pilot study results

A paired-samples *t*-test was conducted to compare RT to consistent and inconsistent pairs. There was a significant difference in the scores for consistent (M = 782.81 ms, SD = 195.23) and inconsistent pairs (M = 1764.77 ms, SD = 450.67); $t(9) = -8.17$, $p < .001$, 95% CI [-1253.77, -710.14] with a large effect size (Cohen's $d = -2.83$).

A paired-samples *t*-test was conducted to compare accuracy to consistent and inconsistent pairs. There was a significant difference in the scores for consistent (M = .80, SD = .11) and inconsistent pairs (M = .66, SD = .16); $t(9) = 3.85$, $p = .004$, 95% CI [.057, .220] with a large effect size (Cohen's $d = 1.02$).

Before the main implicit results of the current study, the next two sections present whether ancient and modern stressors could be explicitly distinguished (hypothesis 1) and the association between the explicit and implicit measures (hypothesis 1a).

Table 7.3

Means, standard deviations (SD in brackets) and range of IAT and psychological variables (N = 100)

Measures	*Mean*	(*SD*)	Range
IAT score			
RT (in ms) Consistent pairs	948.67	(281.52)	452.25-1622.29
RT (in ms) Inconsistent pairs	1629.98	(457.76)	729.93-2702.65
Accuracy Consistent pairs	.79	(.11)	.50-.98
Accuracy Inconsistent pairs	.75	(.13)	.34-.96
D scores	.14	(.60)	-.98-1.93
Psychological variables score			
Total number Ancient stressors coped with	5.14	(3.73)	0.00-9.00
Mean severity Ancient stressors coped with	1.48	(1.79)	0.00-7.00
Total number Modern stressors not coped with	2.96	(2.57)	0.00-6.00
Mean severity Modern stressors not coped with	2.40	(2.00)	0.00-9.00

7.4.2.2 Distinction between ancient and modern stressors using the explicit measures

A chi-square test for association was conducted between ancient and modern stressors and ability to cope with the stressor (hypothesis 1). All expected cell frequencies were greater than five. There was a statistically significant weak association between stressors and coping, $\chi^2(1) = 9.78$, $\varphi = .22$, $p = .002$, such that ancient stressors were associated with the ability to cope with the stressor and modern stressors with inability to cope (Figure 7.1).

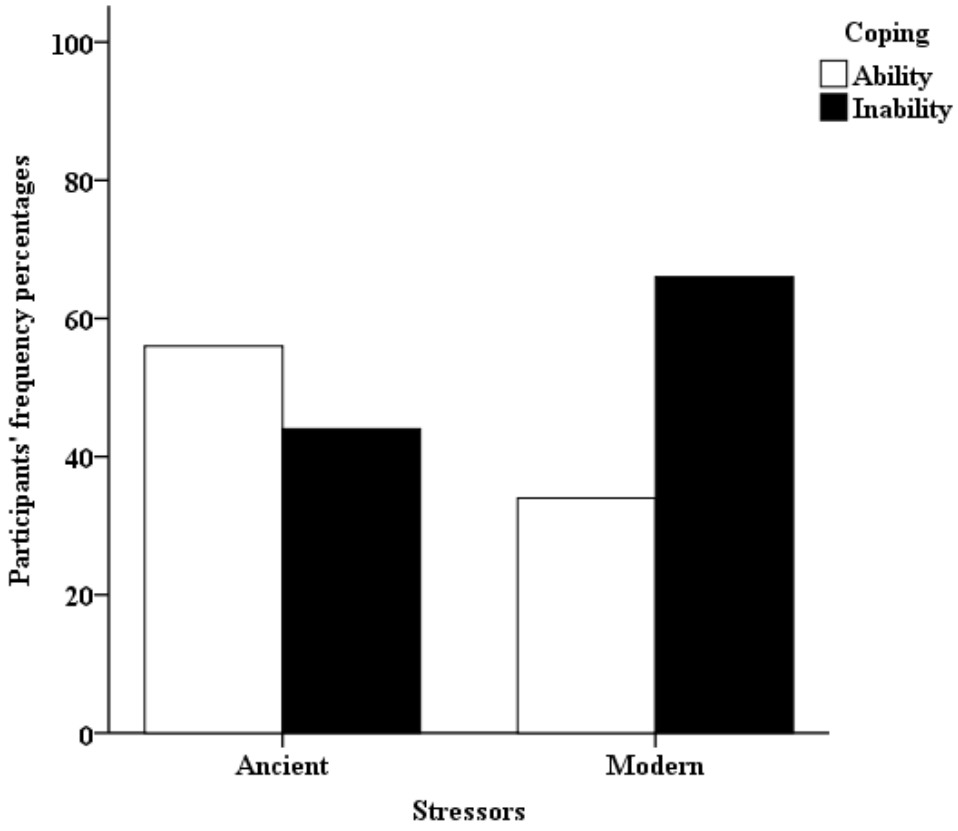

Figure 7.1. This diagram indicates the association between ancient stressors and ability to cope, and modern stressors and inability to cope in adults.

Additionally in order to provide a more holistic analysis, a chi-square test for independence was conducted between ancient and modern stressors with experience and ability to cope with the stressor (hypothesis 1). All expected cell frequencies were

greater than five. There was a statistically significant moderate association between stressors and experience and coping, $\chi^2(3) = 31.21$, $\varphi = .40$, $p < .001$, such that ancient stressors were associated with previous experience and ability to cope compared to modern stressors (Figure 7.2).

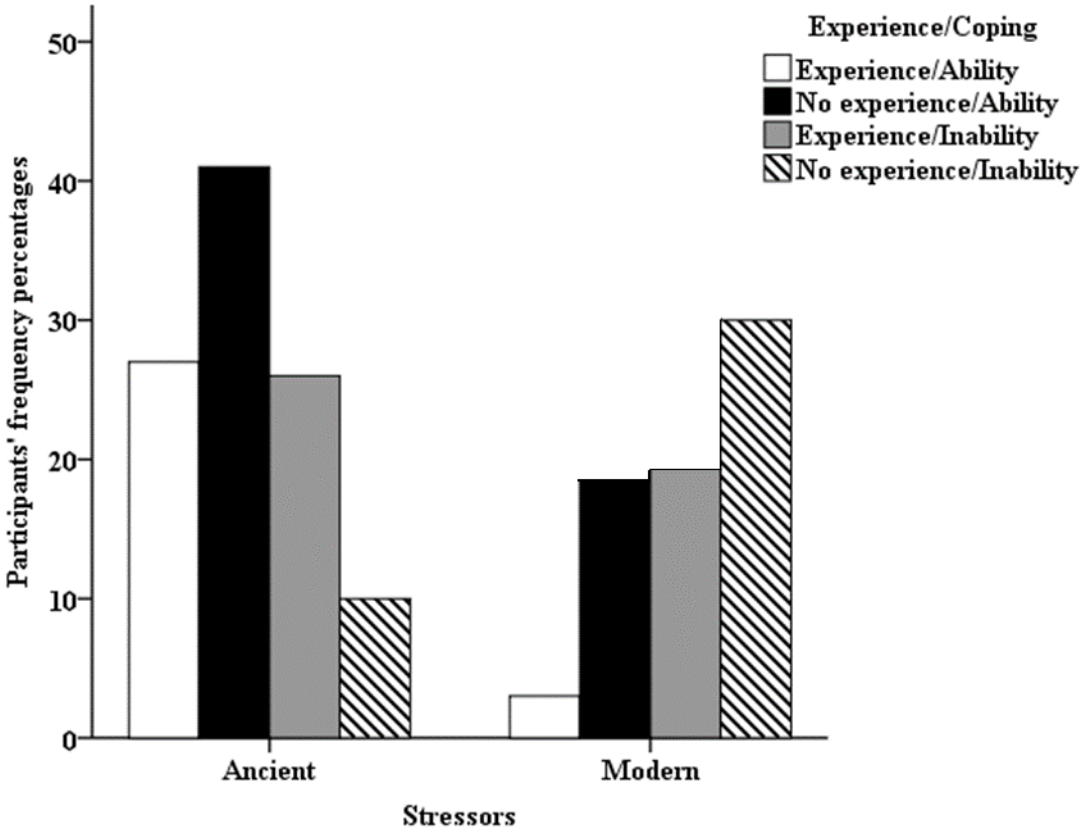

Figure 7.2. This diagram indicates the association between ancient stressors with previous experience and ability to cope, and modern stressors with no experience and inability to cope in adults.

Furthermore, to assess an explicit distinction, a paired samples *t*-test was conducted comparing the total number of ancient and modern stressors. There was a significant difference in the scores for ancient stressors ($M = 5.14$, $SD = 3.73$) and modern stressors ($M = 2.96$, $SD = 2.57$); $t(99) = 12.43$, $p < .001$, 95% CI [1.83, 2.53] with a medium effect size (Cohen's $d = .07$) indicating that adults dealt with more ancient than modern stressors.

Comparing severity of ancient and modern stressors, a significant difference was found in the severity scores for ancient stressors (M = 1.48, SD = 1.79) and modern stressors (M = 2.40, SD = 2.00); $t(99) = -6.49$, $p < .001$, 95% CI [-1.20, -.639] with a medium effect size (Cohen's d = -.48) indicating that adults found modern stressors more stressful than ancient.

7.4.2.3 The explicit and implicit measure associations

Pearson's r correlations were conducted between the explicit and implicit measures (hypothesis 1a) and revealed no significant associations indicating that both measures are distinct, divergent and separate from each other (Table 7.4).

7.4.3 Inferential statistics

7.4.3.1 Repeated-measures ANCOVA

Moving onto hypothesis 2 results, a repeated-measures ANCOVA indicated a main effect of RT $F(1, 97) = 4.06$, $p = .047$, partial $\eta^2 = .04$, such that RT for consistent pairs (M = 948.67 ms, SD = 281.52) was faster than for inconsistent pairs (M = 1629.98 ms, SD = 457.76) (hypothesis 2a).

A repeated-measures ANCOVA indicated a main effect of accuracy $F(1, 97) = 4.40$, $p = .039$, partial $\eta^2 = .04$, such that accuracy for consistent pairs (M = .79, SD = .11) was higher than for inconsistent pairs (M = .75, SD = .13) (hypothesis 2b). Gender and age were not significant as main effects controlling for them in both hypotheses.

Table 7.4

Correlations between explicit and implicit measures (N = 100)

Explicit variables	Implicit variables				
	RT Consistent pairs	RT Inconsistent pairs	Accuracy Consistent pairs	Accuracy Inconsistent pairs	*D* scores
Total number Ancient stressors coped with	.014	-.012	.028	.032	.039
Mean severity Ancient stressors coped with	-.045	.011	-.116	.150	-.012
Total number Modern stressors not coped with	.033	-.043	.079	-.029	-.013
Mean severity Modern stressors not coped with	-.068	-.012	-.100	.126	-.096

Note. * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$

7.4.3.2 Alternative analysis: *D* scores

Regarding hypothesis 2c, *D* scores were analysed using a univariate ANCOVA and entered as the DV; the explicit measure was entered as the IV; and gender, age and order of blocks as covariates. The analysis indicated neither a main effect of explicit measure ($p = .797$), nor indirect effects of age ($p = .063$) and order of blocks ($p = .053$). Gender, although conceptualised as a covariate in analysis, effectively revealed an indirect effect; $F(1, 95) = 9.17$, $p = .003$, partial $\eta^2 = .09$.

Further independent *t*-test revealed that males ($M = .43$, $SE = .07$) showed a stronger preference for the consistent pairs than females ($M = .05$, $SE = .07$), $t(71.84) = 3.65$, $p < .001$, 95% CI [.173, .590] with a medium to large effect size (Cohen's $d = .73$) (Figure 7.3) indicating that males rather than females associated faster and more accurately ancient stressors and ability to cope than modern stressors and inability to cope. This might also imply that males showed a stronger implicit distinction between ancient and modern stressors than females.

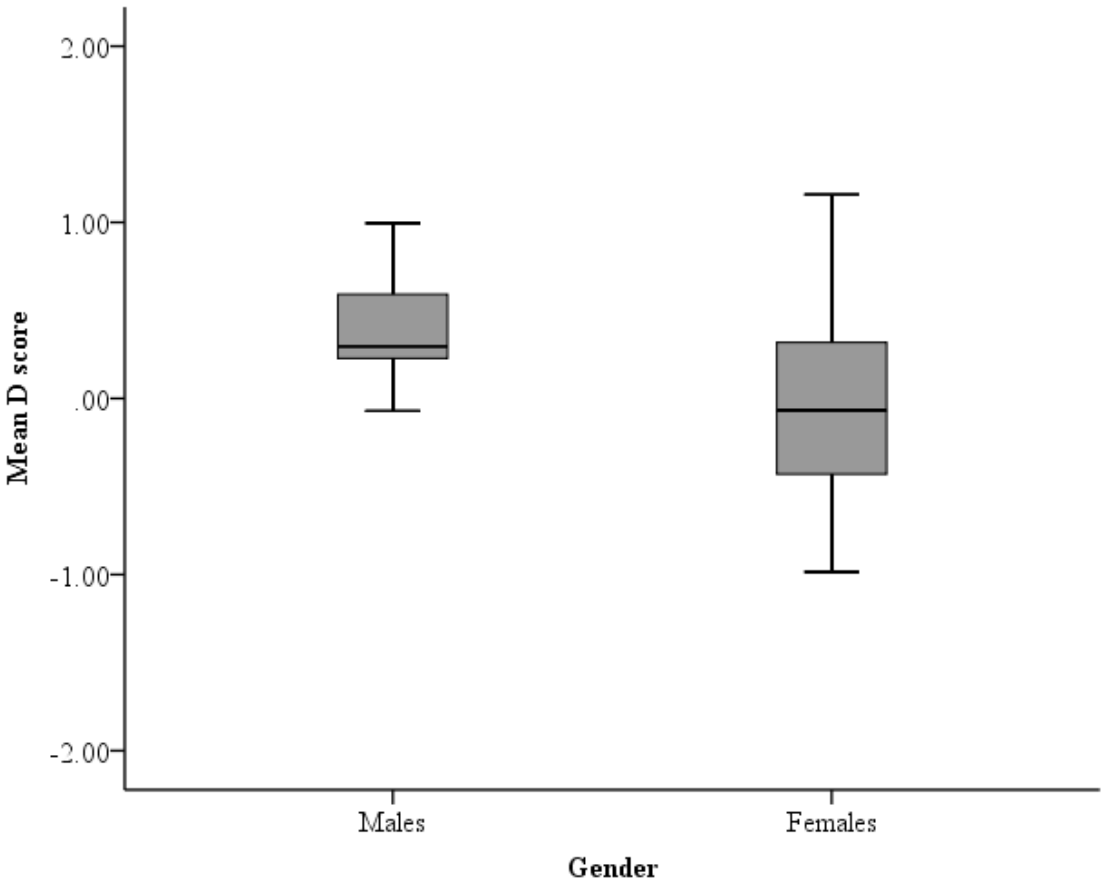

Figure 7.3. Mean *D* scores for gender; positive scores indicate a preference for consistent pairs and negative scores suggest a preference for inconsistent pairs.

7.5 Discussion

This section will discuss and interpret the findings of the current experimental study in relation to the previous research about ancient and modern stressors. The main purpose of study three was to explore the feasibility of distinguishing between ancient and modern stressors at an unconscious, implicit, cognitive level. This study was the first to use an implicit paradigm to examine the validity of the ancient and modern stressors distinction in adults that were found in the previous two studies.

Having established a distinction between ancient and modern stressors in studies one and two, study three using an implicit experimental paradigm provided support for this distinction which will be discussed. The main finding of the current study was that

adults could implicitly distinguish between ancient and modern stressors associating faster and more accurately the consistent concept pairings of ancient stressors/ability to cope and modern stressors/inability to cope, than ancient stressors/inability to cope and modern stressors/ability to cope. This finding is in line with previous research and it also verifies the provisional distinction between ancient and modern stressors found in studies one and two.

7.5.1 Discussion about the ancient and modern stressors distinction

7.5.1.1 The explicit distinction

In accordance with hypothesis one, the findings suggested that there was a significant association between ancient stressors and ability to cope and modern stressors and inability to cope; and that adults explicitly distinguished between ancient and modern stressors. In addition, the findings suggested that adults could explicitly distinguish between ancient and modern stressors according to the psychological characteristic of experience in conjunction with coping. A significant association was found between ancient stressors and previous experience and ability to cope, and modern stressors with no previous experience and inability to cope. Regardless of experience, adults were also more likely able to deal with ancient than modern stressors. These findings, which imply an explicit distinction between ancient and modern stressors, confirm and are in line with the findings of studies one and two suggesting that: previous experience and ability to cope (i.e. adaptive coping) constitute psychological characteristics of ancient stressors, and no previous experience (i.e. novel experience) and inability to cope (i.e. maladaptive coping) constitute characteristics of modern stressors.

These findings are congruent with the theoretical background around ancient and modern stressors and coping processes (McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling & Eyer, 1988). Modern stressors have been considered as more stressful than ancient stressors and as having been more recent and unfamiliar with ancestral human evolution it was expected people to be less able to deal with them. These findings also confirm the findings of the previous two studies presenting and supporting an explicit distinction between the stressors. The concept of ancient and modern stressors is not subject to social acceptability so is less likely to be influenced by self-presentation and social desirability concerns or individuals' unwillingness and faking (Hofmann et al., 2005); in the present study participants were not aware of the distinction between ancient and modern stressors, thus it was more likely to find an explicit association.

Regarding hypothesis 1a, no associations were found between the explicit (self-report questionnaires) and implicit (IAT) measures. This finding is in line with the previous research about the explicit-implicit association that has been already discussed in the introduction of this chapter. While both explicit and implicit measures have been considered as real measures, this was not the case in the current study as there is no valid and reliable ancient and modern stressors psychological scale. This lack of an explicit ancient and modern stressors measure might be the reason for not being correlated with the implicit measure. However ancient and modern stressors were treated in the same way as in the previous two studies in order to be consistent. Despite this, this finding is congruent with previous research supporting that explicit and implicit measures do have distinct characteristics and are completely independent from each other even when measuring the same construct; for example, no association was found between STAI anxiety and IAT anxiety (Egloff & Schmukle, 2004) which implies inconsistency between the measures (Hofmann et al., 2005).

Another reason why no association was found is because people were not aware of unconscious associations between ancient and modern stressors with coping, thus they introspectively generated only explicit associations (Nosek et al., 2005). Lastly, there has been a large variation in the relationship between self-reports and IAT due to several reasons, although a lot of studies have shown weak or even sparse and non-significant associations (Dovidio et al., 2001), because both measures involve different processes and thus are not necessarily expected to be empirically related (Egloff & Schmukle, 2002, 2003; Greenwald & Nosek, 2001; Greenwald et al., 2003; Greenwald et al., 2009; Lane et al., 2007; Schnabel et al., 2006). However, as Greenwald et al. (1998) stated, weak or absent associations do not reflect weaknesses but instead represent the nature of measures. This finding also supports the idea that low associations imply true implicit findings which are not affected by one's introspective control and awareness (Gawronski et al., 2006; Hofmann et al., 2005).

This was the first study to explore explicitly and implicitly ancient and modern stressors in stress and psychology research. Although much attention has been paid to the explicit-implicit association, a literature question that has been placed and needs to be answered is not "Do implicit and explicit attitudes relate to one another?" but instead "Under what conditions, and for what kind of people, are implicit and explicit measures related?"; even when there is an association between the measures, implicit and explicit attitudes constitute different paradigms (Lane et al., 2007, p. 76).

7.5.1.2 The implicit distinction

In accordance with hypotheses 2a and 2b, the findings suggested that adults implicitly associated faster and more accurately consistent (ancient stressors/ability to cope; modern stressors/inability to cope) than inconsistent pairs (ancient

stressors/inability to cope; modern stressors/ability to cope). In accordance with hypothesis 2c, adults implicitly indicated a stronger preference to associate ancient stressors with ability to cope and modern stressors with inability to cope, than ancient stressors with inability to cope and modern stressors with ability to cope. Furthermore, males showed a stronger preference than females for consistent than inconsistent pairs.

These implicit findings are consistent and imply that adults can distinguish between ancient and modern stressors at a cognitive, unconscious, implicit level. In line with the limited existing theory put forward by Schreier and Evans (2003), ancient stressors were associated more quickly and accurately with coping processes than modern stressors with less ability to cope. Using also the improved *D* score algorithm, individuals indicated a stronger cognitive preference to associate ancient than modern stressors with coping. Through the implicit associations, adults appeared to be more able to deal with life events that have been designated as ancient stressors than with modern life events. Therefore, the second hypothesis has been confirmed. Individuals, who have not been aware of the ancient and modern stressors concept, showed that an implicit unconscious distinction might exist.

These findings also imply that individuals are more likely to be able to inherently deal with those life event stressors that have been an integral part of human evolution history rather than more modern life events that mismatch with the familiar ancient past due to established coping processes (Eaton et al., 2002; Ghadimi et al., 2018; Li & Kanazawa, 2016; Martin et al., 2017; Schreier & Evans, 2003; Tooby & Cosmides, 1990; Trevathan, 2007). Further to this, according to Leary et al. (2006) and MacLean (1990) the human brain has been evolutionary and innately predisposed to deal spontaneously and automatically with more ancestral rather than modern conditions. This might be an explanation why adults in the current study associated

faster and more accurately ancient stressors with ability to cope than modern stressors. According to this explanation, it could be suggested that ability/inability to cope is one of those psychological characteristics (as in studies one and two) that enable adults to implicitly distinguish between ancient and modern stressors (McEwen, 1998b, 2007; Sterling, 2012).

Having found an explicit distinction between ancient and modern stressors does not invalidate the implicit distinction but instead it confirms and strengthens these associations through an implicit paradigm. Similarly, Egloff and Schmukle (2004) reported that women explicitly and implicitly showed higher levels of anxiety than men. The IAT has been considered as an experimental and more reliable tool to investigate automatic, mental, cognitive, unconscious processes which are closer to true attitudes than self-reports (Greenwald et al., 1998; Greenwald et al., 2003; Greenwald et al., 2009; Lane et al., 2007; Nosek et al., 2005; Sato & Kawahara, 2012). Thus, if implicit associations are stronger than explicit associations, this implicit distinction might exist at an innate level which agrees with the theory that there are established psychophysiological coping processes to deal with ancient stressors since those life events have been an integral part of human evolutionary history.

7.5.2 Discussion about strengths and limitations of study three

The current study was the first to explore the ancient and modern stressors distinction using an experimental paradigm and to investigate whether adults could implicitly distinguish between the stressors. Ancient and modern stressors have not been previously examined using the IAT, which is a well-validated measure of automatic mental implicit attitudes and associations that people are not consciously aware of; yet there is not any perfectly accurate measure because of anticipated

variations (Greenwald & Banaji, 1995; Greenwald et al., 1998; Greenwald et al., 2003; Nosek et al., 2005). The current study also benefitted from the sufficient and satisfactory sample size of 100 adults as well as from the use of the explicit measure. As has been already discussed extensively that there is not any psychological scale about ancient and modern stressors, the explicit measure used for the purposes of study three was consistent with the measure that was used in the previous two studies. The major strength of the present study is that it identified an implicit distinction between ancient and modern stressors, which is in line with the distinction that has been found in the previous two studies, in the current study using the explicit measure and in theory (Schreier & Evans, 2003). Although there is a huge debate about the use of implicit and explicit measures together or separately as well as the reliability and validity of IAT itself and its scoring processes, there has been an agreement that the IAT is a more reliable tool than other priming tasks (Lane et al., 2007).

Regarding the practical nature of this study, the participants were recruited entirely from the Bath and North East Somerset area resulting in a relatively homogeneous sample; future research would benefit from conducting studies with populations from different social, ethnic backgrounds or from specific age groups (Jackson et al., 1991). For example, it would be expected to find differences between people from different cultural backgrounds as culture could influence the way one appraises ancient and modern stressors. However prior to any future research, the construction of an ancient and modern stressors measure is essential in order to evaluate and replicate the current findings.

In terms of methodological issues, word and image stimuli were selected very carefully in order to best represent only one category and to avoid any confusion; each stimulus was identifiable and represented only one category as well as it was explicitly

distinguishable from other stimuli (Lane et al., 2007; Nosek et al., 2005). Issues relating to the application of this IAT paradigm to the ancient and modern stressors include a lack of uniformity, mental representation and conceptual meaning of images in individuals from different backgrounds. Although this appeared not to be a case in the current study, future research would benefit from probably using only word stimuli or perfectly represented life events images.

In addition, the categories of 'having sufficient resources'/'not having sufficient resources' might not have been a precise description of ability/inability to cope as participants might have considered physical or material resources as opposed to coping strategies that were assessed in the current study. Despite this, these categories serve the purposes of this study. Control for other method-related issues (e.g., order of measures and IAT blocks, number of stimuli per category, counterbalance) were considered based on previous research by additionally using the improved *D* scoring algorithm, although there is still a research debate about the influence of those factors in IAT effects. Extraneous factors that the current study could not control for and future research has been recommended to consider were individuals' cognitive fluency, faking and introspection; Greenwald (2004) had admitted that these still constituted unresolved problems in IAT.

The design of this IAT paradigm did not appear to cause any discomfort or unwillingness which might have prevented participants reporting their true beliefs. Individuals' social desirability, self-presentation concerns and biased motivation to answer in a specific way in self-reports should always be considered as extraneous factors (Lane et al., 2007), albeit they appeared not to be subject to the current study as people were not aware of the ancient and modern stressors concept.

Lastly, even though the IAT has been used in several domains of psychology there has been very little work around stress research. For this reason until further research is conducted, any interpretations about implicit associations should be made with caution and with reference to previous research findings and literature. In order to ensure a good level of interpretation of findings, the implicit paradigm that was used in the current study followed the design guidelines of published articles and took into account IAT theory. Also the analysis was carried out in two different ways: the conventional and the improved scoring which provided consistent results. Nonetheless the improved algorithm has been regarded as a better measurement of implicit associations than the conventional IAT-score as it computes the difference and variance between and within the block latencies (i.e. error measurement). However, there is still some uncertainty about the meaningful comparisons it can provide because it statistically standardises both the mean and variance of the scores (Blanton & Jaccard, 2008; Greenwald et al., 2003).

Considering a deeper level of interpretation that relates to the ancient and modern stressors theory, future research could test and replicate the current findings using another implicit priming task, i.e. Go/No Go Association Task (GNAT) (Nosek & Banaji, 2001) measuring single associations between concept and evaluation stimuli. In this case, the ancient and modern stressors would be used as the concept categories (as they used in the current IAT: 'old problems'/'new problems') and ability to cope stimuli as the only evaluation category eliminating the inability to cope stimuli. According to Schreier and Evans (2003), people are more able to adapt and deal efficiently with ancient than modern stressors, therefore it would be expected that participants would make faster and more accurate single unconscious associations between ancient stressors and coping stimuli than modern stressors and coping. Such a single unconscious association first would imply that ability to cope (adaptive coping) is

mainly associated with ancient stressors; second would enable to conclude that individuals do have inherited physiological and psychological coping mechanisms; and third would aid the definition of ancient stressors in relation to coping from a psychological perspective.

Future research would also benefit from exploring implicit associations and understanding of ancient and modern stressors with physical health and illness. As the theory suggests (McEwen, 1998b, 2007; McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling, 2012; Sterling & Eyer, 1988) it would be expected that participants would associate faster and more accurately modern than ancient stressors with physical health. The second study of this research programme also showed that cold symptoms were best predicted by modern than ancient stressors. This evidence opened a new research window to assess the relationship between ancient and modern stressors and physical health. Using an implicit paradigm, automatic cognitive mental associations would enable to understand why the nature of modern than ancient stressors is associated with physical health outcomes and probably with inability to achieve allostasis.

7.5.3 Conclusions of study three

The present study not only confirmed the distinction between ancient and modern stressors that was found in the previous two studies, but it also provided a new insight in this distinction using an experimental implicit paradigm. Adults could differentiate ancient from modern stressors at a cognitive unconscious level and make implicit associations between ancient stressors with ability to cope and modern stressors with inability to cope. These findings, which are supported from previous but limited literature and research, imply that there is an explicit and implicit distinction between

ancient and modern stressors. Also according to the theory, the findings suggest that there are specific ancient life events with which individuals can deal more efficiently than with other modern life events that people are less able to deal with resulting in a potential greater impact on physical health. Study three added to research knowledge that the existence of ancient and modern stressors also lies at an innate level although these stressors are not well-known; and that people are more likely to associate ancient than modern stressors with the ability to cope not only explicitly but also implicitly due to the psychological characteristics of those stressors.

Chapter Eight: Overall Discussion

8.1 Chapter overview

This chapter will provide an overview of the main findings from each of the three studies in this research programme. It will integrate and discuss these findings in relation to the research questions from the three studies: i) younger and older adults' experiences of ancient and modern life event stressors; ii) SCEs and physical health outcomes (i.e. common cold symptoms); iii) psychological stressor characteristics and the implicit association between stressors and coping. This overall discussion will draw together the findings in the context of ancient and modern stressors and relevant theories, and will also discuss strengths and limitations of the overall research programme followed by future recommendations and potential applications.

8.2 Overall findings

This section will discuss the main findings of all three studies in relation to the research questions (Chapter one; p. 22). The overall aim of this research programme was to explore the feasibility of distinguishing between ancient and modern stressors within a health context from a psychological perspective. The research questions this research programme aimed to investigate were:

1. Which psychosocial factors do younger adults find stressful and why; can these reasons provide evidence to categorise stressors as ancient and modern? [Study one; part one].
2. What are the necessary criteria to make a provisional distinction of psychosocial stressors as ancient and modern? [Study one; part two].

3. Can the stress appraisal and stress experiences of older adults provide evidence of underlying psychological stressor characteristics to explore the feasibility of distinguishing between ancient and modern stressors? [Study two].
4. Are ancient and modern stressors implicitly distinguishable? [Study three].

Study one consisted of two parts and assessed the feasibility of distinguishing between ancient and modern stressors. The first part suggested that life events were associated with SCEs, and explored and identified those life events that younger adults encountered and experienced as stressful. These life events were organised into six higher-order themes: health and well-being, personal interactions and the self, career and occupation, news events, physical activity involvement, and financial and legal issues. This initial attempt to provisionally designate life events as ancient and modern stressors regarding adaptation and coping provided some initial evidence. The second part of study one considered life event stressors that had been a priori designated as ancient and modern by Schreier and Evans (2003), in order to provide a plausible, albeit provisional, rationale for an ancient/modern distinction. The study found evidence that younger adults were more likely to express shame when associated with ancient stressors than with modern, and this finding was stronger in women than men. Five psychological characteristics were found to underlie ancient and modern stressors, namely: coping, experience, manageability/expectedness, duration and type of stressor. Ancient stressors were characterised by adaptive coping, past experience, controllability/predictability, short duration, and simple type of stressor. Modern stressors were characterised by maladaptive coping, novel experience, uncontrollability/unpredictability, long duration, complex and multiple stressors.

Study two assessed the feasibility of distinguishing between ancient and modern stressors in older adults considering their perceptions of life events, shame and guilt,

and physical health experiences. This study found evidence for older women that reported shame associated with modern stressors; for older adults that experienced guilt associated with ancient stressors; and for modern stressors that were positively associated with cold symptoms. The qualitative content analysis confirmed the psychological stressor characteristics and validated the provisional distinction between ancient and modern stressors.

The general ancient/modern distinction as applied to stress is applicable to both younger and older adults, suggesting no gender differences in coping with ancient stressors and SCE experiences, and no age differences as both population samples appraised modern life events as more stressful than ancient. Both studies suggested that younger and older adults were able to adapt and deal with the life events of death/bereavement of family members/friends, health/illness of others, and social/interpersonal arguments designated as ancient stressors. They were less able to deal with the life event stressors of unemployment, financial problems, health/illness of self, and separation/distance designated as modern, and with the a priori ancient-designated stressor of movement that was regarded as more modern, suggesting a re-assessment and potential re-designation of this stressor. Based on younger and older adults' experiences, the qualitative method and analyses that were employed and the characteristics that were identified, both studies one and two provided some grounded evidence to explicitly distinguish between ancient and modern stressors.

Having initially assessed the feasibility of distinguishing between ancient and modern stressors and established the psychological characteristics on which this distinction was based in studies one and two, study three examined whether an implicit distinction between ancient and modern stressors might be observed. The IAT paradigm found evidence that ancient stressors were implicitly associated with the ability to cope

and modern stressors with inability to cope. Study three not only validated and strengthened the provisional explicit/conscious distinction between ancient and modern stressors, but also suggested that adults could distinguish between the stressors in relation to ability/inability to cope at a cognitive, unconscious and implicit level.

8.3 Relating the findings to theory

8.3.1 Ancient and modern stressors can be explicitly distinguishable

These sections will combine and discuss the main findings of this research programme regarding the transactional theory of stress and coping (Lazarus & Folkman, 1984b), theory of allostasis and allostatic load (Sterling & Eyer, 1988), and research surrounding ancient and modern stressors (Schreier & Evans, 2003). The first research question explored which life event stressors younger adults encountered and found stressful and the reasons why. This evidence was considered to designate psychosocial stressors as ancient and modern based on adaptation and coping, as suggested by Schreier and Evans (2003). Regarding the second and third research questions, the findings from the present research were in accordance with the transactional model of stress and coping which focuses on the person-environment relationship, and the appraisal of resources and emotions (Lazarus & Folkman, 1984b).

Younger and older adults in studies one and two experienced and appraised psychosocial life event stressors, and reported if and how they dealt with these stressors and the emotions that were elicited (i.e. SCEs: shame and guilt) (Dienstbier, 1989; Ellsworth & Scherer, 2003; Tangney & Dearing, 2003). Adaptation and coping are directed towards the stressor resulting in a favourable or unfavourable, event or emotion, outcome (Glanz et al., 1990; Lazarus, 1966, 1991; Lazarus et al., 1970;

Lazarus & Folkman, 1984b; Roseman et al., 1996; Smith & Kirby, 2009; Smith & Lazarus, 1993; Spacapan & Oskamp, 1988).

Figure 8.1 presents the original transactional model (i.e. shaded parts), which was adapted based on this research's findings (i.e. light and coloured parts). According to the transactional model of stress and coping as shown in the shaded parts of the figure (Lazarus & Folkman, 1984b), a stressor can be regarded as the agent that can potentially cause stress, if the individual appraises it as threat, loss, harm or challenge and determines whether the available coping mechanisms are sufficient to deal with it. According to Schreier and Evans (2003), a person is likely to be more familiar and able to deal with stressors that have been around for many years than with those stressors that could be classified as more recent developments. This is where the ancient and modern stressors fit in and expand the transactional model in order to establish this concept from a psychological perspective.

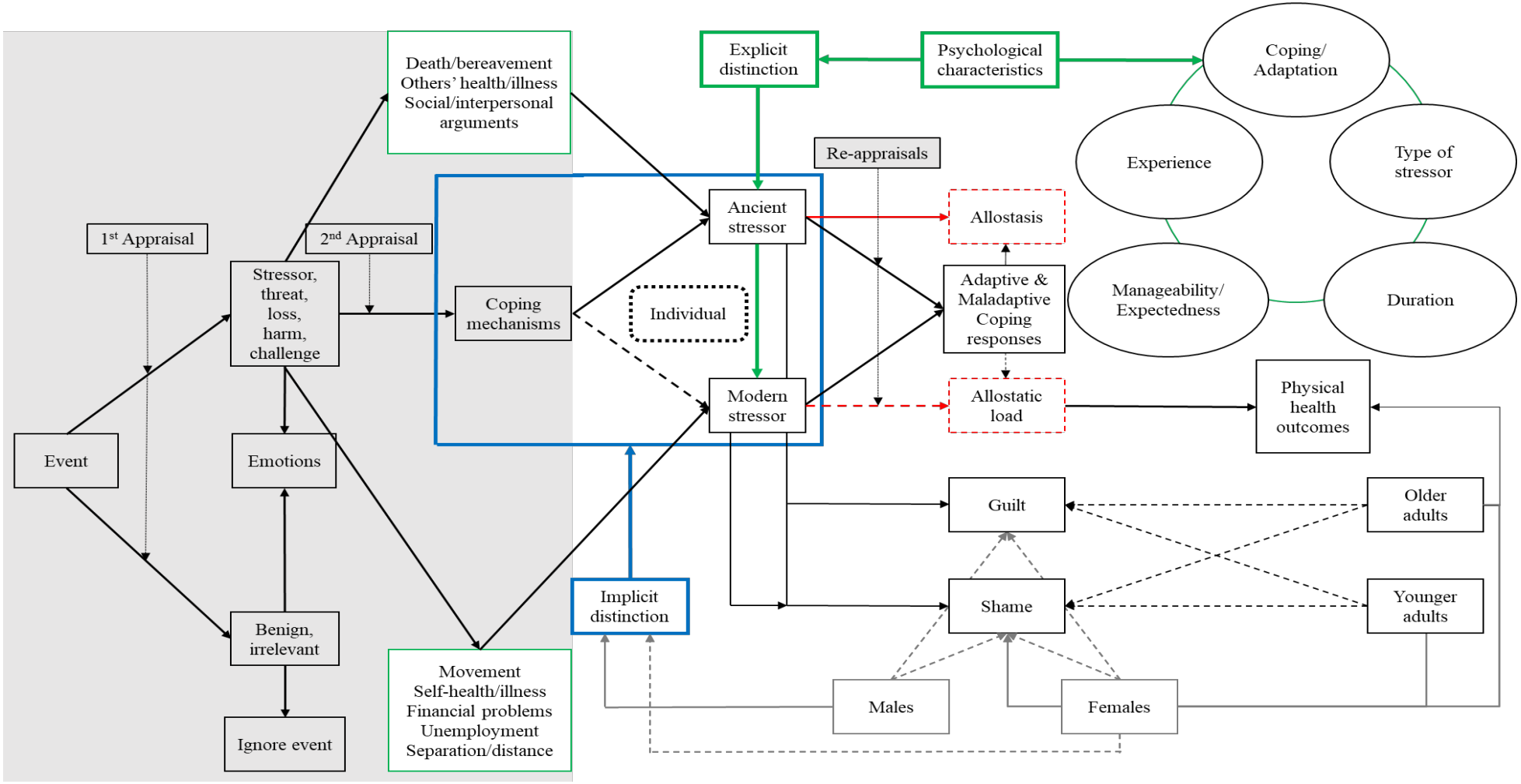

Figure 8.1. The modified original transactional model of stress and coping based on the findings of this research. The shaded parts represent the original transactional model considering the central role of the individual (Folkman, 1997); and the light parts the application of ancient and modern stressors distinction and the subsequent coping responses onto this model along with the theory of allostasis and allostatic load.

Considering the findings and that this programme of research was the first to assess ancient and modern stressors, this overall research suggested that it is of central importance the individual perceptions and appraisals of the stressor as well as their adaptive/maladaptive coping resources, and the psychological stressor characteristics in order to distinguish between these stressors. For this reason and until further research takes place, the present research recommended that a life event stressor could not be exclusively regarded as ancient or modern for individuals but instead a stressor could move along a continuum either more on the ancient or modern side. For example, the life event of social/interpersonal arguments might have been considered by different people as an ancient or modern stressor leading respectively to adaptive or maladaptive coping, as also shown in the figure below. Thus, this research assessed the psychological and not the evolutionary nature of ancient and modern stressors enabling a provisional classification of stressors based on the continuum concept.

Based on the transactional theory, this research suggested that a stressful stimulus, as shown in the light part, can be further distinguished as ancient or modern in relation to its psychological characteristics as such derived from individuals' appraisals and perceptions of stressors (Abbott et al., 1984; Anisman & Merali, 1999; Bollini et al., 2004; Maier & Watkins, 2005; Rose, 1980; Sapolsky, 1994). As the primary and secondary appraisals take place simultaneously, it is expected that individuals would be able to adapt and deal with ancient stressors. Ancient stressors are shaped from the need of people to achieve stability through change (i.e. allostasis), whereas modern stressors that mismatch with the more familiar ancient past, might have implications for allostatic load (Flinn et al., 2011; Li & Kanazawa, 2016; McEwen & Stellar, 1993; Sterling & Eyer, 1988). Allostasis and allostatic load, as shown in the red dashed boxes, were not directly assessed in this research programme through for example the immune and endocrine systems. Future work on ancient and modern stressors should include

measures of allostatic load in order to explore whether, how and why these stressors affect people's physiological systems. However, they were added in this modified figure in order to theoretically represent putative and potential associations between ancient/modern stressors and allostasis/allostatic load (Schreier & Evans, 2003; Sterling & Eyer, 1988).

From an evolutionary perspective, people might have established psycho-physiological coping processes that enable them to deal with ancient stressors that have been an integral part of human evolutionary history and more closely linked to their ancestral past environments, compared to the more modern stressors that have been considered as evolutionarily newer and mismatch with this past (Eaton et al., 2002; Tooby & Cosmides, 1990; Trevathan, 2007). From a psychological perspective, individuals' body and brain might have been indeed equipped with primitive and innate physiological and psychological coping processes that enable them to adapt, achieve stability of homeostasis through change and survive towards threats (Flinn et al., 2011; MacLean, 1990; McEwen & Gianaros, 2010; Sterling, 2012). Evidence found in this programme of research has been based on the interpretation that individuals are more able to explicitly and implicitly associate ancient rather than modern stressors with the ability to cope. This accords with the predominant view in the limited ancient and modern stressor literature that humans are better equipped with adaptive and coping responses towards demands that have been since the beginning of human evolutionary life (Schreier & Evans, 2003).

However, in the case of a modern stressor, it is expected that individuals would be less able to deal with and achieve this stability (i.e. allostatic load), as illustrated in the light part of the figure with the bold red dashed line. If this is the case, several cognitive re-appraisals continue to take place to define the most appropriate coping

mechanisms, which might result in a repeated physiological stress activity leading to the exhaustion stage in GAS (Selye, 1956, 1976) or inadequate adaptation and response, higher allostatic cost and greater impact on health (McEwen, 1998b, 2007; McEwen & Stellar, 1993; Sterling & Eyer, 1988). In the latter case, this stressor could be seen as modern because these stressors have been more recent and thus people might need more time and physiological energy to deal with (Schreier & Evans, 2003). Considering also the psychological characteristics of these stressors and that modern stressors were associated with greater cortisol release and higher HPA axis activity, it would be expected that modern stressors might lead to prolonged physiological overreaction of allostatic systems resulting in wear and tear of the body and poor physical health (Cheung & Li, 2012; Henry & Grim, 1990; Rose, 1980; Schreier & Evans, 2003; Sterling & Eyer, 1988; Tooby & Cosmides, 1990; Williams & Nesse, 1991).

Focusing on the link between stress and illness outcomes (Cohen et al., 2009; Cohen et al., 1998; Cohen et al., 1991; Cohen & Williamson, 1991; Sapolsky, 1994), study two found an association between modern stressors and cold symptoms. This finding can be related to the theory of allostasis (McEwen, 1998b; McEwen & Stellar, 1993; Sterling, 2012; Sterling & Eyer, 1988) suggesting that the amalgam of psychological characteristics of modern stressors may have negative implications on adults' physical health resulting in allostatic load. Older adults were likely to be susceptible and vulnerable to poorer physical health outcomes (e.g., to catch a common cold) associated with modern stressors (as shown on the right of the figure with the black thin elbow line) because of their inability to deal with these stressors or because modern stressors might weaken the physiological systems.

Modern stressors were associated with more negative cold symptoms than ancient stressors, suggesting that an insufficient and ineffective stress response (i.e.

coping and adaptation) to unfamiliar new demands may have implications on physical health. Although the impact of modern stressors on allostatic systems might also be a product of the susceptibility and vulnerability of older adults to physical health symptoms compared to younger adults, the fact that modern stressors can still be distinguished from ancient in relation to physical health accentuates the importance of the distinction. Thus, if modern stressors had a greater health impact than ancient then in older age this impact would occur to an even greater extent.

From an evolutionary and psycho-endocrine perspective and according to the Darwinian concept, different organisms employ several psycho-physiological and behavioural coping responses towards stress in order to maintain allostasis. But still these organisms not only differentiate from each other in coping processes based on gender but also at an individualistic level (Korte et al., 2005). For example, the current findings suggested no gender differences in coping with ancient stressors, which is in line with this Darwinian idea, between younger and older male and female adults. However, the current research did not examine individual personality differences in coping with the stressors. Thus, future work could examine individual differences and potentially create different individualistic patterns (e.g., phenotypes) for ancient and modern stressors.

8.3.1.1 The contribution of gender and age in ancient and modern stressors

In the wider coping and emotions literature, previous research suggests gender differences in coping and SCEs experience (Efthim et al., 2001; Folkman & Lazarus, 1980; Lewis & Ramsay, 2002; Marco, 2004; Pivetti et al., 2016), findings that support age differences between younger and older adults (Berg & Upchurch, 2007; Folkman et

al., 1987; Meléndez et al., 2012; Moos et al., 2006; Orth et al., 2010), and findings that suggest small or no differences (Aldwin, 1991; Matud, 2004; Tamres et al., 2002).

Problem and emotion-focused and meaning-based coping strategies were employed to deal with ancient stressors. The most prevalent coping mechanism used by older adults was active coping as opposed to younger adults who employed to the same extent both problem and emotion-focused coping; a finding that contradicts a part of previous research that older adults are likely to use passive and emotion-focused coping (Berg & Upchurch, 2007; Diehl et al., 1996; Koenig et al., 1988; Moos et al., 2006).

Both younger and older adults experienced modern life events as more stressful than ancient, albeit older adults experienced modern stressors as less stressful than younger adults but still more stressful than ancient. The explanation provided in this thesis is that older adults might have been better equipped to adapt and deal with ancient stressors than younger adults due to their acquisition of coping skills across their lifetime and past experience, as suggested by previous work (Aldwin et al., 1996; Perry et al., 2015). Previous experience might imply a difference between younger and older adults in coping with stressors.

Studies one and two also suggested that the SCEs of shame and guilt were reported by both younger and older male and female adults in relation to ancient and modern stressors, as shown from the dashed black and grey lines at the bottom right of the figure. Younger and older females were more likely to experience shame and guilt than males; as reported in previous research (Lewis, 1995; Moksnes et al., 2010; Orth et al., 2010; Roberts & Goldenberg, 2007; Tangney & Dearing, 2003). However, comparing the overall self-reported SCE scores older adults appeared to be more able to regulate negative SCEs than younger adults (Carstensen et al., 2000; Henry, Castellini, Moses, & Scott, 2016; Tangney, Miller, et al., 1996). The findings of both studies

suggest that SCEs do not constitute a distinguishable characteristic between ancient and modern stressors.

As discussed in the literature review chapter, SCEs were assessed in this research programme because they were relevant to the ancient/modern stressor distinction due to the innate nature and evolutionary history of these emotions (Folger et al., 2014; Luyten et al., 2002), and their association with increased stress reactivity (Lewis & Ramsay, 1997, 2002). Shame associated with chronic stress has been linked with increased cortisol which might have implications for health (Miller et al., 2007). Although SCEs were not proven helpful to distinguish between ancient and modern stressors, it is important to consider alternative interpretations of why shame and guilt were associated with both categories of stressors. However these explanations might not provide adequate clarifications of the findings of this research. An explanation would be that the more ancient a stressor, the lower levels of self-reported shame and guilt were due to individuals' ability to cope. If that was the case, SCEs would be a product of positive self-reflection of actions and behaviours to deal efficiently with ancient stressors. However, this interpretation can be dismissed in response to the findings of the present research because participants revealed a stronger association between ancient stressors and SCEs than modern stressors. Participants appeared to be more likely to report negative SCEs in relation to ancient stressors as these stressors might have been appraised as more important to themselves, their self-evaluation and own standards, compared to modern stressors. In such a case, SCEs are not elicited directly from the stressors but instead from one's appraisal, behaviour and actions towards the stressor (Bulger, 2013; Lewis et al., 1989; Miller et al., 2007; Robins & Schriber, 2009; Tangney & Dearing, 2003).

Thus far, the discussion of studies one and two findings in line with previous research answered the second and third research questions. The hypothesis that the findings of study two would replicate those of study one, was confirmed, providing further validity for the distinction and extending conclusions for an ancient/modern stressor distinction into an older age group of adults. These findings provided some initial empirical basis for the ancient/modern stressor distinction. They provided a plausible rationale and explanations about how ancient and modern stressors fit into and expand the transactional theory and are linked to the theory of allostasis and allostatic load. As illustrated by the green boxes in the figure, the psychological characteristics enabled an explicit conscious distinction between ancient and modern stressors. This argument was also in line with the notion of adaptation and ability to cope, as suggested by Schreier and Evans (2003). For this reason, the modified model shows a direct association between coping and ancient stressors (with a solid line in the centre of the figure) which represents the ability of individuals to adapt and deal with ancient stress, whereas it illustrates with a dashed line the association between coping and modern stressors in order to represent that people might be less able to adapt and deal with more modern demands. Additionally, this research programme suggested that coping/adaptation is one of the psychological characteristics that enable the distinction between ancient and modern stressors. The remainder of the discussion will now focus on the fourth research question which assessed the implicit ancient/modern stressor distinction in relation to coping, as shown with the blue-framed box in the figure.

8.3.2 Ancient and modern stressors can be implicitly distinguishable

Study three built upon the findings of the explicit distinction between ancient and modern stressors in relation to ability/inability to cope that were identified in

studies one and two, and explored this distinction within an implicit paradigm (Greenwald et al., 1998; Greenwald et al., 2003). It furthered the current research and added a new insight to the wider stress literature by identifying that ancient-designated life events could be implicitly and unconsciously differentiated from modern-designated life events.

Adults showed a strong preference to associate ancient stressors with an ability to cope and modern stressors with an inability to cope, and this finding was stronger in men than women. These findings also supported the notion suggested by Schreier and Evans (2003) that there are established coping mechanisms that enable people to deal with ancient stressors. The cognitive mental associations between ancient stressors and ability to cope, which strengthened this implicit distinction, has been in accordance with previous work suggesting that: i) dispositional, stable coping (Ghadimi et al., 2018); ii) paleomammalian coping brain (Flinn et al., 2011; MacLean, 1990); and iii) natural, spontaneous, automatic, hypo-egoic coping strategies (Leary et al., 2006; Martin et al., 2017) enable people to deal with familiar stressors.

Adaptive coping or dispositional, hypo-egoic ability to cope does not constitute only a psychological characteristic of ancient stressors, but also facilitates distinguishing between ancient and modern stressors in relation to the ability/inability of coping at an implicit, unconscious and even innate level. These established cognitive coping processes enable individuals to deal with the imbalance between the person and environment transactions and ancient demands, and keep homeostasis stable through change in order to result in positive health implications and favourable event or emotion outcomes.

These findings could be interpreted in two ways. Firstly, it might be more feasible to define ancient than modern stressors in relation to adaptation/coping as i)

these stressors have accompanied human beings throughout their existence, ii) have been linked to the familiar ancestral past, and iii) people have had established coping mechanisms to deal with ancient stressful demands (Ghadimi et al., 2018; Leary et al., 2006; Li & Kanazawa, 2016; MacLean, 1990; Martin et al., 2017; Schreier & Evans, 2003; Tooby & Cosmides, 1990; Trevathan, 2007). Secondly, although studies one and two did not indicate any gender differences in coping, potential gender differences might exist at an unconscious, implicit level in relation to the relationship between stressors and coping, as study three suggested that males compared to females might be more intuitive based on their evolutionary history and innate reactions. At this level, people have been less consciously aware of the constructs under evaluation (i.e. stressors; coping) and thus they have been more willing and able to report their true attitudes and beliefs compared to what they would do at a conscious, explicit level (e.g., in self-report questionnaires) (Engelhard et al., 2007; Greenwald & Banaji, 1995; Lane et al., 2007). Therefore, it might be also important for future research to explore implicit associations between the stressors and ability/inability to cope in male and female, younger and older adults.

A multiphase design was employed in this research programme using a range of methods including quantitative questionnaires, qualitative interviews and a computer-based task. These methods enabled a broader and more holistic picture of the feasibility to distinguish between ancient and modern stressors in adults. Although the research around the novel and innovative ancient and modern stressors concept is limited to only one published article, the current research suggested an explicit/conscious and implicit/unconscious distinction between the stressors incorporating the wider literature and previous research. The current programme expanded and added a new insight into research aiming to make stress a more comprehensible term for wider populations and inform applied health psychology with a new classification of stress.

8.4 Overall strengths and limitations

The specific strengths and limitations of each study have been discussed in the relevant chapters; this section will focus on the relative merits and shortcomings of the overall programme of research. Regarding the strengths, the methodological approach taken in study one and study two to assess the feasibility of distinguishing specific self-reported life events as ancient and modern provided a defensible and justifiable rationale. The focus on the a priori designation of ancient and modern stressors by Schreier and Evans (2003) offered an initial empirical grounded evidence as this research was the first which examined this novel and innovative concept from a psychological perspective.

Studies one and two also provided a unique discourse on younger and older adults' experiences and feelings about life events stressors, coping and physical health, which have not previously been explored in relation to this topic. The qualitative analysis in particular enabled the identification of psychological stressor characteristics, which in turn provided a more holistic view of a provisional distinction between ancient and modern stressors (Mayring, 2014; Vaismoradi et al., 2013). Study three delivered a unique task building upon the previous findings and research about ancient and modern stressors (Greenwald et al., 1998; Greenwald et al., 2003). This last study not only validated the conscious distinction between ancient and modern stressors, but also moved forward the current research suggesting that ancient stressors could be implicitly differentiated from modern stressors.

However, there are several limitations within the current research. The first limitation is that although the findings of the first part of study one (i.e. higher-order themes) were not considered later on at any point in the research, the lower-order themes were more relevant as life events to subsequent work. Although higher-order

themes provided a rich description of younger adults' experiences about stressful life events and daily hassles, the methodological switch and the focus on the analysis of the matched life event stressors did not enable the assessment of these life event themes as ancient and modern stressors. However, it is important to mention that this assessment would be made in terms of coping and adaptation; a concept that by itself was not sufficient to assess the feasibility of distinguishing between ancient and modern stressors.

Another important limitation that needs to be discussed is the association between ancient and modern stressors and SCEs. The transactional model of stress and coping incorporates the appraisal of emotions and previous research has found associations between stress and SCEs (Lazarus, 2006; Lazarus & Folkman, 1984b; Smith & Lazarus, 1993). Although direct and alternative interpretations and explanations have been provided for the associations between ancient and modern stressors and SCEs, there might be explanations, such as evolutionary or developmental, that are beyond the scope of this research. For example, the evolutionary processes that underlie SCEs and ancient and modern stressors might differ from and not be applicable to each other in relation to the biopsychological factors (e.g., appraisal) that affect these emotions and stressors (Folger et al., 2014; Gilbert & McGuire, 1998). As previous work suggests (Bulger, 2013; Lewis & Ramsay, 1997, 2002; Luyten et al., 2002; Tangney & Dearing, 2003) that SCEs are by themselves a distinct category of emotions based on their characteristics as the ancient and modern stressors concept is by itself novel, the combination of these topics might have not been suitable to distinguish between the stressors.

Further to the discussion about SCEs, another difference in the findings of studies one and two was the mean scores of self-reported shame and guilt-proneness.

The means in study two were lower than in study one and in particular in the SCE of shame (see Table 6.4 and Table 4.3 respectively). A possible explanation for this variation in means of shame between studies is the psychological scale measures that were used. Study one assessed several SCEs using the scenario-based TOSCA-3 (Tangney & Dearing, 2003; Tangney et al., 2000), whereas study two examined only shame and guilt using the self-report questionnaires of ISS and GI respectively (Cook, 1988, 1996; Jones et al., 2000). An explanation for the change in SCE scales was based on literature that argues shame and guilt are regarded as the most distinct and important SCEs which is in accordance with the initial findings of study one (Dickerson, Kemeny, et al., 2004; Duncan & Cacciatore, 2015; Lazarus, 2006; Tangney, 1991, 1995). However, in line with previous research older adults are more able to regulate emotions than younger adults, which explains the current findings (Carstensen et al., 2000; Gross et al., 1997; Henry et al., 2018; Labouvie-Vief et al., 1987; Lawton et al., 1993; Tangney, Miller, et al., 1996). Although all the scales used measured proneness to SCEs as traits and the mean differences were small (Bulger, 2013; Tangney & Dearing, 2003), it would be beneficial in future study to use the same psychological scales across studies in order to be consistent.

Comparing the current SCE scales used in this research programme with other scales that have been used in other studies (e.g., Positive and Negative Affect Schedule (PANAS); The State Shame and Guilt Scale (SSGS)), it could be suggested future research to assess SCEs as state emotions in relation to ancient and modern stressors (Dickerson et al., 2008; Marschall, Sanftner, & Tangney, 1994; Watson, Clark, & Tellegen, 1988). For example, in a longitudinal study using diaries such an assessment of SCEs as states would enable exploration of these emotions not as pre-dispositional characteristics but as transitory dispositions (Bulger, 2013): to examine the SCEs that

are elicited precisely the moment that ancient and modern stressors are experienced by individuals.

Any interpretations regarding age and gender differences in coping should be made with caution and predominately in relation to ancient and modern stressors. Although there is a huge variation in findings with most recent research finding small and sometimes no differences in coping between younger and older adults and males and females, any differences found in this research programme should be explained in particular regarding ancient and modern stressors. This research suggested a pattern that regardless of age and gender, both younger and older adults and males and females were more able to adapt and deal with ancient than modern stressors. This provides some initial evidence and future research needs to further explore age and gender differences in coping with stressors.

With regard to weaknesses of the research in respect to interpretation, study two found that cold symptoms could be best predicted by modern stressors. Although this finding suggested an indicative association between modern stressors and cold symptoms according to its connection with the wider literature surrounding allostasis and allostatic load (McEwen, 1998b; McEwen & Stellar, 1993; Schreier & Evans, 2003; Sterling, 2012; Sterling & Eyer, 1988), the current research suggested that modern stressors, compared to ancient stressors, might result in greater negative implications for physical health. Thus any interpretation about this association should be made with caution as this was the first study which examined associations between ancient/modern stressors and cold symptoms. However, considering the characteristics that underlie modern stressors, future research could examine the health outcomes and underlying physiological mechanisms directly.

The current programme and in particular study two attempted to explore associations between the stressors and self-reported physical health outcomes (i.e. common cold symptoms) in naturalistic settings, as other previous studies have done (Hamrick et al., 2002; Turner-Cobb & Steptoe, 1996, 1998). Future laboratory research could assess whether the experience of ancient and modern life event stressors would lead individuals to develop URTIs by intentional exposure to a common cold virus (Cohen et al., 1998; Cohen et al., 1991; Cohen, Tyrrell, & Smith, 1993). It would be expected that experience of modern stressors and inability to deal with them would result in weakening of immune system, due to prolonged physiological activity and allostatic load, and therefore to negative physical health implications.

As has already been discussed, ancient and modern stressors would also benefit from a bio-physiological assessment of for example salivary cortisol. Schreier and Evans (2003) found that modern stressors were positively associated with greater cortisol and HPA axis activity. Considering also the theory of allostasis that unsuccessful or repeated overreaction of allostatic systems towards stress result in wear and tear of bodily systems (Sterling & Eyer, 1988), it would be expected that inability to adapt and deal with modern rather than ancient stressors would result in allostatic load and further ill-health.

Another limitation of this work relates to the sample populations that were recruited across all studies. All three exploratory research studies were conducted in the wider area of Bath resulting in a relatively homogenous sample as all participants were adults and the majority were White/Caucasian, with a fairly high educational level and from higher SES backgrounds. Although the sample sizes of all three studies have been considered as satisfactory according to a power calculation in order to generalise the findings (Cohen, 1992), the broader socio-political context in which the current research

was placed should be acknowledged. The nature of these samples is likely to have had an impact on the findings of all three studies. The conclusions of this research are perhaps not directly applicable to other SES populations as Cohn (2014) has argued that health psychology and similar scientific fields are more in favour of some groups than others; higher than lower SES groups especially. Therefore, important experiences could be missing from this research, including narratives of adults from lower or higher SES backgrounds, children, adolescents or elderly people, or adults from different ethnic orientations. Previous work for example, has identified low SES populations as being more likely to experience unsuccessful adaptation to stressors and allostatic load than high SES people (Beckie, 2012). Future research could utilise similar methods to assess ancient and modern stressors experiences in other populations (Burroughs et al., 2003; Jackson et al., 1991; Quarterman, 2008). An indicative example of such an experience is the life event of poverty, which has been designated as an ancient stressor by Schreier and Evans (2003) and is more likely to be experienced by low SES backgrounds as according to Maslow's hierarchy of needs people need to meet their basic needs (physiological, safety, love/belonging) before their needs related to esteem and self-actualisation (Maslow, 1954).

Another shortcoming with the current research was the lack of use of coping questionnaires (e.g., Ways of Coping; COPE inventory) (Carver, 1997; Carver et al., 1989; Folkman & Lazarus, 1985). Since the aim of this thesis was to distinguish between ancient and modern stressors and these stressors and ability to cope have been discussed from the literature review to the current chapter, it would make sense to consider and ask why no coping measures were used. Any quantitative associations between the stressors and coping was out of interest. However, studies one and two qualitatively explored such associations, and study three also associated ancient stressors with ability to cope. The coping strategies discussed in the interviews with

participants were much more in depth than any self-report questionnaire that could have been used. However it would have been beneficial to have a quantitative measure of coping because this would enable direct comparisons and differences to be identified in coping with stressors between studies one and two with younger and older adults, and further would elucidate if past experience constitutes a coping mechanism mainly related to older adults as in study two. The interest of this research was to explore the 'if and how' people have established coping processes, and not the 'what', in order to investigate individuals' ability or inability to cope with stressors.

The in-depth interviews in studies one and two covered a wide range of topics such as experience of and feelings about life event stressors, coping strategies and the impact of stressors on physical health. This was very useful as these topics have not been discussed with younger and older adults in the context of ancient and modern stressors before and it was important to investigate their perspectives on these topics. Nevertheless, there were perhaps too many topics to cover in one interview considering also the average length of the interviews. Interviews that are quite long can be tiring for participants as discussed in earlier chapters, thus fewer topics would have enabled more time to be spent on those topics leading to a much deeper discussion without participant burden (Miles & Gilbert, 2005).

In addition, the scope of the analysis of interviews in study one switched in order to identify psychological characteristics, as previously discussed, to assess the feasibility of distinguishing between ancient and modern stressors. With regard to the qualitative analysis in study two, the main purpose was to explore the ancient/modern stressor distinction in older adults. Different qualitative analytic methods could have been employed, such as interpretative phenomenological analysis considering the pragmatic restrictions in order to explore how adults understand, think and make sense

of ancient and modern stressors and then to identify psychological characteristics (Brocki & Wearden, 2006; Pietkiewicz & Smith, 2014; Smith, Bekker, & Cheater, 2011; Smith, 1996). Thus, future research could reanalyse the data from study two in order to redefine any missed characteristics; for example, timing and frequency of stressors (Anisman & Merali, 1999) as well as its favourable or unfavourable outcomes.

Most of the limitations thus far have regarded study one and study two, however the final shortcomings relate to study three. Study three purposefully did not examine any specific age group in adulthood (e.g., either younger and/or older adults) in order to draw potential conclusions about the implicit ancient/modern stressor distinction across adulthood. Although issues related to the term 'older adults' have been discussed in chapter six (Erikson & Erikson, 1998; Erikson et al., 1994; Forman et al., 1992; Newman & Newman, 2017), the mean age in study three was 28 years which indicates a young adult population. In this case, it would be prohibitive to conclude that adults in general can differentiate ancient from modern stressors implicitly as this study recruited predominately younger adults. Future research would benefit from replicating study three findings in a greater adult age range using similar methods (Greenwald et al., 1998; Greenwald et al., 2003). However in such a case, this implicit computer-based paradigm might have been inappropriate and inhibitory to be used in older adults. This is because the implicit tasks measure reaction times, the speed to associate one concept with another; and speed is one of the human abilities that naturally decreases as people age according to the field of cognitive psychology and gerontology (Der & Deary, 2006; Spirduso, 1980). Nevertheless, if speed could be controlled for, it would be expected that older adults compared to younger adults would be faster and more accurate associating ancient stressors with coping due to the factors that have been mentioned in chapter seven. Additionally, controlling for age, it would be possible to compare within the older adult age group assessing between ancient/modern stressors.

The implicit task that was used in study three has been regarded as a valid and true measure of mental associations as well as a widely used test in several scientific fields, it does however still have a few unresolved problems as previously discussed (Dovidio et al., 2001; Fiedler et al., 2006; Greenwald & Nosek, 2001; Hofmann et al., 2005; Nosek et al., 2005). Future research could further explore ancient and modern stressors using a brain activity test (e.g., an electroencephalogram; EEG) which could assess whether specific brain regions are activated when a person encounters an ancient or modern stressor, as for example Chee et al. (2000) found when one performs an IAT using functional magnetic resonance imaging (fMRI). Another shortcoming with study three was that the stressors that were examined in the explicit measure were extracted from the LEI and thus they were not a truly explicit measure (Tennant & Andrews, 1976), compared to other studies which assessed for example anxiety using STAI and IAT anxiety measures (Egloff & Schmukle, 2004). Although these life events were used in previous studies, the assessment of these in the implicit measure might have not been in the most appropriate way. An ancient and modern stressors measure appears to be an imperative need.

Indeed, it is vital here to further emphasise the importance of an ancient and modern stressor measure, which has been extensively discussed throughout the previous chapters. Despite this, it is really important to acknowledge that although all the possible and best efforts were made to follow a reasonable and plausible methodological approach, the lack of this measure constituted the major weakness of this research programme. However, the lack of such a measure was not one of the main points as this research programme looked at the feasibility and validity of the ancient/modern stressor distinction. It is believed that this novel and innovative concept that has not been previously examined firstly balances out this limitation as long as any over-interpretation of findings was avoided and was specific in relation to ancient and

modern stressors, and secondly this research programme has initially carried out some of the ground work for this potential measure.

8.4.1 Potential development of a psychological scale to measure ancient and modern stressors

As no measure currently exists to specifically assess ancient and modern stressors, the development of such a dedicated measure appears to be a crucial next step in future research to examine the utility of ancient and modern stressors. Along with the empirical evidence of the a priori classification of ancient and modern stressors from Schreier and Evans (2003), this programme of research suggested that the life events of death/bereavement, others' health/illness and social/interpersonal arguments could be regarded as ancient stressors whilst unemployment, financial problems, self-health/illness and separation/distance as modern stressors. Such a measure would also enable the consideration of the debatable life event of movement as a modern stressor, even though it was originally designated as an ancient stressor. In addition, the psychological characteristics need to be applied in the construction of an ancient and modern stressors measure. Such a measure could be theoretically developed as a scenario-based questionnaire in order to be validated.

Appendix I provides an indicative description of the ancient life event of 'health/illness of others' presenting how the structure of the stressors measure could be applied using the psychological characteristics. For example, the participants would be provided with a scenario-based life event situation and they would be firstly asked to answer if a similar life event has ever happened (regarding the psychological characteristic of experience) and how stressful this was. In relation to coping, then they would be asked to provide information on how they dealt with this life event; this would

also enable the gathering of some qualitative data. Using a visual scale of thermometers to measure the characteristics of manageability and expectedness, the participants would be asked to indicate how able they were to control and predict this life event. Lastly, the participants would be asked to provide information and thoughts regarding the specific or a similar life event; this might enable further exploration in greater depth the type of stressor.

A scenario-based measure could also be displayed on the web navigating the participants based on their responses to the relevant questions. The development of an ancient and modern stressors measure would not only enable examination of those eight life event stressors that have been identified as ancient or modern, but also provide access to a larger pool of life events and hassles based on the findings from a framework analysis in previous work conducted by the researcher (Katsampouris & Turner-Cobb, 2015). For example, the findings from this pilot work had suggested that inadequate personal organisation, intellectual and educational competition, time pressure, environment/weather, social and family issues, physical appearance, and end of a relationship could be regarded as ancient stressors; whereas the lack of adequate time, future planning, goals and choices, life complexity, lack of organisation, factors resisting exercise and news events could be considered as modern stressors.

8.5 Future research and applications

This programme of research assessed the feasibility of distinguishing life events as ancient and modern stressors in a health context based on psychological characteristics in adults. Future research is required to replicate this finding and support this distinction in younger and older adult populations. Further investigation of this distinction could be tested in children in order to examine the replicability of Schreier

and Evans (2003) findings as well as adolescent, middle-aged and elderly people. Assessing children's appraisal and experiences of ancient and modern stressors might also provide an indication of innate characteristics of stressors in relation to adaptation/coping. An assessment of a lifespan approach regarding ancient and modern stressors is suggested in order to explore the experiences and psychological characteristics of these stressors in different age populations. Such an assessment would enable researchers to explore if, how and why young and old individuals react and differ in the appraisal and coping of ancient and modern stressors. From a psychological perspective, this could verify that there are established coping processes that enable people to deal with ancient stressors regardless of age (Schreier & Evans, 2003); and from an evolutionary perspective that experience constitutes a coping characteristic that people acquire while ageing. Such a lifespan exploration would also trigger future research to focus more on the psychological and physiological examination of modern stressors and ways of dealing with them in order to minimise their potential negative effect on health (e.g., allostatic load) (Bottaccioli et al., 2018; Cohen & Herbert, 1996; McEwen, 1998b; McEwen & Stellar, 1993; Steptoe & Cohen, 1999; Sterling & Eyer, 1988).

Future research could continue to assess these specific life events that have been designated as ancient and modern stressors through self-report scales and interviews, otherwise the design of a psychological scale about ancient/modern stressors could incorporate the examination of psychological characteristics. Collection of physiological measurements in relation to ancient and modern stressors could also enable the assessment of whether modern stressors are associated with prolonged physiological arousal of allostatic systems. Other suggestions for future research would be to present a life events-based story examining coping and emotions, and lastly to use brain activity equipment which would allow for a systematic investigation of what brain

areas are activated encountering an ancient or modern stressor. Alterations could also be made in methodology such as the assessment of focus groups or coding from observation as opposed to the one-on-one interviews in studies one and two.

These variations would enable researchers to assess the appraisal and characteristics of ancient and modern stressors and potentially the evaluation of other life events; for example, the re-assessment and re-designation of the life event of movement. The findings could help to focus on some of the coping strategies mentioned in studies one and two or to focus on personality traits in order to create patterns (e.g., phenotypes) not only for ancient and modern stressors but also for individuals or groups of people (e.g., based on phylogenetic features) who are able (or not) to deal with life event stressors. Taking into account that people find modern rather than ancient stressors harder to deal with, research could also offer a psycho-educational approach that could be used in counselling in order to manage stress experience based on the theoretical knowledge of ancient and modern stressors. For example, effective coping strategies employed by older adults to deal with ancient stressors could be suggested to other older individuals who might struggle dealing with the ancient stressor of social/interpersonal arguments, considering individualistic differences and how stressor characteristics are perceived. Lastly, although studies one and two found no gender differences in coping with ancient and modern stressors, future work is called for to focus on individual differences. For example, potential individual differences could be assessed before, during and after the experience of ancient and modern stressors since not all individuals respond to stress in the same way.

From an evolutionary perspective, the Darwinian evolution theory in 1859 and Korte et al. (2005) claimed that organisms differentiate from each other in relation to behavioural responses and adaptation to environmental changes (Li & Kanazawa,

2016). Thus, assessment of individual differences in relation to ancient and modern stressors would enable exploration of how and why different people adopt several stress and coping responses in ancient and modern stressors depending upon their personality traits and social, cultural and racial backgrounds. For example, to identify the reasons why type D (or distressed) personality individuals experience and perceive more stress in general (Sher, 2005), and if and how these people react and deal with ancient and modern stressors specifically. Additionally, to investigate how type A personality individuals characterised by increased sympathetic reactivity and decreased parasympathetic and HPA axis reactivity, and type B personality people characterised by low sympathetic reactivity and high parasympathetic and HPA axis reactivity, experience and deal with these stressors and what is the potential health impact of ancient and modern stressors on individuals with those different characteristics (Korte et al., 2005). Lastly, such an assessment would also enable the exploration of individual differences considering people's appraisal of stressors driven by different cultural and racial environments because people perceive stress in a different way and let alone if affected by their social background, environment and values.

Research work on individual differences could also provide some potential evidence that except for organisms' evolution, stressors might have also evolved from the ancestral to modern days. Such findings would show that modern stressors might have had ancient roots or that today's modern stressors would be tomorrow's ancient stressors. This would help research to consider and identify potential modern stressors that next generations might encounter and to examine coping processes that would enable next generations through a psycho-educational approach to be well-prepared to deal with their modern stressors. This might also prevent people from experiencing negative health implications because of stress.

This research programme is the first to distinguish ancient and modern stressors from a psychological perspective with the ultimate aim to provide a new classification of stress in order to expand research knowledge and understanding about stress responses with the potential to develop ways of coping with stress. Study one and study two were the first to investigate the combination of ancient and modern stressors, coping, SCEs and cold symptoms using a mixed-methods approach providing some initial research basis for future research. The participants in both studies discussed specific life event stressors, so both samples were quite homogenous in terms of stressor experience and age. This homogeneity of stressor experience was suitable for the purposes of both studies. However, future research could examine more heterogeneous samples to better determine the psychological characteristics of ancient and modern stressors. Study two was the first study to associate modern stressors with cold symptoms. Future research would benefit from investigating in more depth this association in order to inform stress research and the field of PNI about the impact of modern stressors on physical health. For example, future work could use diaries in order for participants to record their daily general state of physical health as well as the potential impact on their physical health after encountering a stressor. This approach would allow researchers to make comparisons in the experience of physical health outcomes before and after, and/or during, the stressor experience.

Study three was also the first to employ an implicit cognitive task to assess the distinction between ancient and modern stressors. It contributed to the findings of the distinction between ancient and modern stressors validating not only an explicit distinction but also identifying an implicit distinction. Therefore, this study adds to the stress literature as well as further developing our understanding of ancient and modern stressors and coping. As has been already mentioned, future research would benefit

from examining mental associations between the concepts of stressors and physical health.

This research was conducted with populations of healthy adults (as far as adults considered themselves as healthy) and it was important to gain a fuller understanding of adults' appraisal of ancient and modern stressors before this research moves on to potentially study ill populations in the future. This would be important work because it has been found that older adults with chronic disease had lower social support and positive coping style with negative life events than their healthy counterparts (Zhang et al., 2017). It is not clear if ancient and modern stressors could be applied somehow as a stress classification to clinical settings but it is essential for future work to examine the experience of ancient and modern stressors and the ability to cope in ill individuals in order to make comparisons between healthy and ill populations.

The initial and general aim of this research was to gain a better understanding of ancient and modern stressors in a health context from a psychological perspective, to focus on how knowledge about ancient and modern stressors might identify stressors that might have the most deleterious effect on health, and acknowledge their existence; what these stressors are, how they can be defined, where they originate, and whether they can be classified psychologically within a health context. This research programme was the first to explore this novel and innovative concept and provided a more complete and holistic picture of ancient and modern stressors accomplishing its aim. Besides the findings and limitations of this thesis, future research would be worthwhile to further and more deeply explore the utility of the ancient and modern stressor distinction in a health context in order to prevent people's health implications from the impact of these stressors.

In terms of applied aspects of stress, the exploration of distinguishing between ancient and modern stressors is important as it can inform research and practice in relation to its impact on physical health. Nonetheless, one of the core NHS values is to improve people's health, well-being and QoL. Therefore, from a theoretical standpoint knowing whether a stressor is ancient or modern might enable research and practice to find ways of efficient coping in order to reduce the effect of stress experience.

8.6 Summary of the thesis

This thesis has outlined the feasibility and validity of distinguishing between ancient and modern stressors in two populations of healthy adults aged 18-24 and 60-75 years. Until now, the novel and innovative concept of ancient and modern stressors has not previously been assessed in an adult population. This thesis suggested an explicit and implicit distinction between ancient and modern stressors using mixed-methods and an experimental implicit paradigm research method. According to previous research and underlying psychological stressor characteristics, this research programme suggested that there are established psychophysiological coping processes that enable adults to adapt and deal efficiently with ancient stressors since these stressors have been an integral part of human evolutionary history. Modern stressors have been considered newer and more recent to humans and adults have had less time to adapt and cope, resulting in a higher allostatic cost and greater impact on physical health.

The current research programme provided some initial empirical basis about the feasibility and validity of distinguishing between ancient and modern stressors within a health context from a psychological perspective. This thesis added a new stress classification to the broader picture of stress research; expanded the wider health psychology research incorporating evolutionary concepts to the psychological, social,

biological, health and physiological parameters; and attempted to provide a more complete, holistic and comprehensible insight and knowledge of stress to the wider population.

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Appendices

Appendix A: Questionnaires (Study 1)

Life Events Inventory

Listed below are a number of events that commonly occur in everyday life. Please read each statement and circle how stressful it was for you on a scale from 1-7 in the last year. Some life events will not be at all stressful, others may be moderately stressful, while others may be very or extremely stressful. If the life event has not happened during the last year, please circle the number 0. Do not take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

0	1	2	3	4	5	6	7
Not Happened	Not at all Stressful	Mildly Stressful		Moderately Stressful	Very Stressful		Extremely stressful

Life event	*Level of distress*							
1. You had a minor illness or injury like one needing a visit to a doctor or couple of days off university	0	1	2	3	4	5	6	7
2. You had a serious illness, injury or operation needing hospitalization, or a month or more off university	0	1	2	3	4	5	6	7
3. A close relative had a serious illness (from which they did not die)	0	1	2	3	4	5	6	7
4. You were pregnant (with a wanted pregnancy)	0	1	2	3	4	5	6	7
5. You were pregnant (with an unwanted pregnancy)	0	1	2	3	4	5	6	7
6. You had a stillbirth	0	1	2	3	4	5	6	7
7. You had an abortion or miscarriage	0	1	2	3	4	5	6	7
8. You had a baby	0	1	2	3	4	5	6	7

9. You adopted a child	0	1	2	3	4	5	6	7
10. Your partner had a child or you adopted a child	0	1	2	3	4	5	6	7
11. Your partner died	0	1	2	3	4	5	6	7
12. A child of yours died	0	1	2	3	4	5	6	7
13. A close family member died (e.g. parent, sibling, etc.)	0	1	2	3	4	5	6	7
14. A close family friend or relative died (e.g. aunt, uncle, grandparent, cousin, etc.)	0	1	2	3	4	5	6	7
15. You got married/engaged	0	1	2	3	4	5	6	7
16. There has been increasing serious arguments with your partner	0	1	2	3	4	5	6	7
17. There has been a marked improvement in the way you and your partner are getting on	0	1	2	3	4	5	6	7
18. You have been separated from your partner for more than a month because of personal difficulties	0	1	2	3	4	5	6	7
19. You have been separated from your partner for more than a month (for reasons other than relationship difficulties)	0	1	2	3	4	5	6	7
20. You have got back together again after a separation due to personal difficulties	0	1	2	3	4	5	6	7
21. You began an affair	0	1	2	3	4	5	6	7
22. Your partner began an affair	0	1	2	3	4	5	6	7
23. You have been divorced	0	1	2	3	4	5	6	7
24. You began a “steady” relationship	0	1	2	3	4	5	6	7
25. You broke off your engagement	0	1	2	3	4	5	6	7
26. You broke off a “steady” relationship	0	1	2	3	4	5	6	7
27. You had increasing arguments or difficulties with your partner or steady friend	0	1	2	3	4	5	6	7

28. A new person came to live in your household (apart from a new baby)	0	1	2	3	4	5	6	7
29. There has been marked improvement in the way you get on with someone close to you (excluding your partner)	0	1	2	3	4	5	6	7
30. You have been separated from someone important to you (other than close family members)	0	1	2	3	4	5	6	7
31. There has been a serious increase in arguments or problems with someone who lives at home (excluding your partner)	0	1	2	3	4	5	6	7
32. There have been serious problems with a close friend, neighbor or relative not living at home	0	1	2	3	4	5	6	7
33. You started a course (i.e. University, College, or other occupational training course)	0	1	2	3	4	5	6	7
34. You changed to a different course	0	1	2	3	4	5	6	7
35. You completed your training program, placement/internship	0	1	2	3	4	5	6	7
36. You dropped out of your training program	0	1	2	3	4	5	6	7
37. You studied for, or did, important exams	0	1	2	3	4	5	6	7
38. You failed an important exam	0	1	2	3	4	5	6	7
39. You have been unemployed and seeking work for a month or more	0	1	2	3	4	5	6	7
40. You failed your own assignment	0	1	2	3	4	5	6	7
41. You were sacked	0	1	2	3	4	5	6	7
42. You graduated	0	1	2	3	4	5	6	7
43. You were downgraded at work	0	1	2	3	4	5	6	7
44. You were promoted	0	1	2	3	4	5	6	7

45. You began to have troubles with your tutor/boss, supervisor or fellow classmates/workers	0	1	2	3	4	5	6	7
46. You had a big change in the hours you had lectures/worked	0	1	2	3	4	5	6	7
47. You had a big change in the people, duties or responsibilities in your department/work	0	1	2	3	4	5	6	7
48. You started in a completely different type of course/job	0	1	2	3	4	5	6	7
49. You had holidays for a week or more	0	1	2	3	4	5	6	7
50. You moved to Bath from overseas	0	1	2	3	4	5	6	7
51. You moved to Bath from Europe	0	1	2	3	4	5	6	7
52. You moved house in Bath	0	1	2	3	4	5	6	7
53. You had moderate financial difficulties	0	1	2	3	4	5	6	7
54. You had a major financial crisis	0	1	2	3	4	5	6	7
55. You are much better off financially	0	1	2	3	4	5	6	7
56. You were involved in a traffic accident that carried serious risk to the health or life of yourself or others	0	1	2	3	4	5	6	7
57. You had minor difficulties with the police or the authorities (which has not required a court appearance, e.g. fine, etc.)	0	1	2	3	4	5	6	7
58. You had more important problems with the police or the authorities (leading to a court appearance)	0	1	2	3	4	5	6	7
59. You had a jail sentence or were in prison	0	1	2	3	4	5	6	7
60. You were involved in civil law suit (e.g. divorce, debt, custody, etc.)	0	1	2	3	4	5	6	7
61. Something you valued or cared for greatly was stolen or lost	0	1	2	3	4	5	6	7

62. Anything else (Please rate and describe below) 0 1 2 3 4 5 6 7

Hassles Scale

Below is a list of everyday events which people might find stressful. Please think how much of a hassle each item was for you in the last month. Circle one number on the right-hand side of the page for each item. Do not take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

0	1	2	3
None/Not applicable	Somewhat	Quite a bit	A great deal

1.	Your parents	0 1 2 3
2.	Other relative(s)	0 1 2 3
3.	Your partner	0 1 2 3
4.	Time spent with family or friends	0 1 2 3
5.	Health or well-being of a family member	0 1 2 3
6.	Sex	0 1 2 3
7.	Intimacy	0 1 2 3
8.	Family/student-related obligations	0 1 2 3
9.	Your friend(s)	0 1 2 3
10.	Fellow classmates	0 1 2 3
11.	University staff	0 1 2 3
12.	Tutor or supervisor	0 1 2 3
13.	The nature of your course	0 1 2 3
14.	Your work load	0 1 2 3
15.	The university's security	0 1 2 3
16.	Meeting deadlines or goals	0 1 2 3

17. Enough money for necessities (e.g. food, clothing, health care, transportation)	0	1	2	3
18. Enough money for education	0	1	2	3
19. Enough money for emergencies	0	1	2	3
20. Enough money for extras (e.g. entertainment, recreation, vacations)	0	1	2	3
21. Financial care for someone who does not live with you	0	1	2	3
22. Investments	0	1	2	3
23. Your smoking	0	1	2	3
24. Your drinking	0	1	2	3
25. Mood-altering drugs	0	1	2	3
26. Your physical appearance	0	1	2	3
27. Contraception	0	1	2	3
28. Exercise(s)/sporting participation	0	1	2	3
29. Your medical care	0	1	2	3
30. Your health	0	1	2	3
31. Your physical abilities	0	1	2	3
32. The weather	0	1	2	3
33. News events	0	1	2	3
34. Your environment (e.g. quality of air, noise level, greenery)	0	1	2	3
35. Political or social issues	0	1	2	3
36. Your neighborhood (e.g. neighbors, setting)	0	1	2	3
37. Conserving (e.g. gas, electricity, water, gasoline, etc.)	0	1	2	3
38. Pets	0	1	2	3
39. Cooking	0	1	2	3
40. Housework	0	1	2	3

41. Home repairs	0 1 2 3
42. Assignments/courseworks	0 1 2 3
43. Presentations	0 1 2 3
44. Taking care of paperwork (e.g. paying bills, filling out forms)	0 1 2 3
45. Home entertainment (e.g. TV, music, reading)	0 1 2 3
46. Amount of free time	0 1 2 3
47. Recreation and entertainment outside the home (e.g. movies, sports, eating out, walking)	0 1 2 3
48. Eating (at home)	0 1 2 3
49. Church or community organisations	0 1 2 3
50. Legal matters	0 1 2 3
51. Being organised	0 1 2 3
52. Social commitments	0 1 2 3
53. Anything else (Please rate and describe below)	0 1 2 3

Perceived Stress Scale

The questions in this scale ask you about your feelings or thoughts during the last month. Please in each case circle your response which represents how often you felt or thought in a certain way. Do not take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response. For each question choose from the following alternatives:

0	1	2	3	4
Never	Almost never	Sometimes	Fairly often	Very often

In the last month, how often…

1. have you been upset because of something that happened unexpectedly?	0 1 2 3 4

2. have you felt that you were unable to control the important things in your life?	0 1 2 3 4
3. have you felt nervous and "stressed"?	0 1 2 3 4
4. have you felt confident about your ability to handle your personal problems?	0 1 2 3 4
5. have you felt that things were going your way?	0 1 2 3 4
6. have you found that you could not cope with all the things that you had to do?	0 1 2 3 4
7. have you been able to control irritations in your life?	0 1 2 3 4
8. have you felt that you were on top of things?	0 1 2 3 4
9. have you been angered because of things that were outside your control?	0 1 2 3 4
10. have you felt difficulties were piling up so high that you could not overcome them?	0 1 2 3 4

Emotions Scale

Below are situations that people are likely to encounter in day-to-day life, followed by several common reactions to those situations. As you read each scenario, try to imagine yourself in that situation. Then indicate how likely you would be to react in each of the ways described. We ask you to rate all responses because people may feel or react more than one way to the same situation, or they may react different ways at different times. Please do not skip any items and rate all responses.

1	2	3	4	5
Not likely				Very likely

1. *You make plans to meet a friend for lunch. At 5 o'clock, you realize you stood your friend up*.

a) You would think: "I'm inconsiderate."	1 2 3 4 5
b) You would think: "Well, my friend will understand."	1 2 3 4 5

c) You'd think you should make it up to your friend as soon as possible. 1 2 3 4 5

d) You would think: "My boss distracted me just before lunch." 1 2 3 4 5

2. *You break something at work and then hide it*.

a) You would think: "This is making me anxious. I need to either fix it or get someone else to." 1 2 3 4 5

b) You would think about quitting. 1 2 3 4 5

c) You would think: "A lot of things aren't made very well these days." 1 2 3 4 5

d) You would think: "It was only an accident." 1 2 3 4 5

3. *You are out with friends one evening, and you're feeling especially witty and attractive. Your best friend's spouse seems to particularly enjoy your company*.

a) You would think: "I should have been aware of what my best friend was feeling." 1 2 3 4 5

b) You would feel happy with your appearance and personality. 1 2 3 4 5

c) You would feel pleased to have made such a good impression. 1 2 3 4 5

d) You would think your best friend should pay attention to his/her spouse. 1 2 3 4 5

e) You would probably avoid eye contact for a long time. 1 2 3 4 5

4. *At work/University, you wait until the last minute to plan a project, and it turns out badly*.

a) You would feel incompetent. 1 2 3 4 5

b) You would think: "There are never enough hours in the day." 1 2 3 4 5

c) You would feel: "I deserve to be reprimanded for mismanaging the project." 1 2 3 4 5

d) You would think: "What's done is done." 1 2 3 4 5

5. *You made a mistake at work/University's group project and find out a colleague is blamed for the error*.

a) You would think the company did not like the coworker. 1 2 3 4 5

b) You would think: “Life is not fair.” 1 2 3 4 5

c) You would keep quiet and avoid the coworker. 1 2 3 4 5

d) You would feel unhappy and eager to correct the situation. 1 2 3 4 5

6. *For several days you put off making a difficult phone call. At the last minute you make the call and you are able to manipulate the conversation so that all goes well*.

a) You would think: “I guess I’m more persuasive than I thought.” 1 2 3 4 5

b) You would regret that you put it off. 1 2 3 4 5

c) You would feel like a coward. 1 2 3 4 5

d) You would think: “I did a good job.” 1 2 3 4 5

e) You would think you shouldn’t have to make calls you feel pressured into. 1 2 3 4 5

7. *While playing around, you throw a ball and it hits a friend in the face*.

a) You would feel inadequate that you can’t even throw a ball. 1 2 3 4 5

b) You would think maybe your friend needs more practice at catching. 1 2 3 4 5

c) You would think: “It was just an accident.” 1 2 3 4 5

d) You would apologize and make sure your friend feels better. 1 2 3 4 5

8. *You have recently moved away from your family, and everyone has been very helpful. A few times you needed to borrow money, but you paid it back as soon as you could*.

a) You would feel immature. 1 2 3 4 5

b) You would think: “I sure ran into some bad luck.” 1 2 3 4 5

c) You would return the favor as quickly as you could. 1 2 3 4 5

d) You would think: “I am a trustworthy person.” 1 2 3 4 5

e) You would be proud that you repaid your debts. 1 2 3 4 5

9. *You are driving down the road, and you hit a small animal*.

a) You would think the animal shouldn't have been on the road. 1 2 3 4 5

b) You would think: "I'm terrible." 1 2 3 4 5

c) You would feel: "Well, it was an accident." 1 2 3 4 5

d) You'd feel bad you hadn't been more alert driving down the road. 1 2 3 4 5

10. *You walk out of an exam thinking you did extremely well. Then you find out you did poorly*.

a) You would think: "Well, it's just a test." 1 2 3 4 5

b) You would think: "The instructor doesn't like me." 1 2 3 4 5

c) You would think: "I should have studied harder." 1 2 3 4 5

d) You would feel stupid. 1 2 3 4 5

11. *You and a group of colleagues worked very hard on a project. Your boss singles you out for a bonus because the project was such a success*.

a) You would feel the boss is rather short-sighted. 1 2 3 4 5

b) You would feel alone and apart from your colleagues. 1 2 3 4 5

c) You would feel your hard work had paid off. 1 2 3 4 5

d) You would feel competent and proud of yourself. 1 2 3 4 5

e) You would feel you should not accept it. 1 2 3 4 5

12. *While out with a group of friends, you make fun of a friend who's not there*.

a) You would think: "It was all in fun; it's harmless." 1 2 3 4 5

b) You would feel small… like a rat. 1 2 3 4 5

c) You would think that perhaps that friend should have been there to defend him/herself. 1 2 3 4 5

d) You would apologize and talk about that person's good points. 1 2 3 4 5

13. *You make a big mistake on an important project at work/University. People were depending on you, and your boss/tutor criticizes you*.

a) You would think your boss should have been more clear about what was expected of you. 1 2 3 4 5

b) You would feel like you wanted to hide. 1 2 3 4 5

c) You would think: "I should have recognized the problem and done a better job." 1 2 3 4 5

d) You would think: "Well, nobody's perfect." 1 2 3 4 5

14. *You volunteer to help with the local Special Olympics for disabled children. It turns out to be frustrating and time-consuming work. You think seriously about quitting, but then you see how happy the kids are*.

a) You would feel selfish, and you'd think you are basically lazy. 1 2 3 4 5

b) You would feel you were forced into doing something you did not want to do. 1 2 3 4 5

c) You would think: "I should be more concerned about people who are less fortunate." 1 2 3 4 5

d) You would feel great that you had helped others. 1 2 3 4 5

e) You would feel very satisfied with yourself. 1 2 3 4 5

15. *You are taking care of your friend's dog while your friend is on vacation, and the dog runs away*.

a) You would think, "I am irresponsible and incompetent." 1 2 3 4 5

b) You would think your friend must not take very good care of the dog or it wouldn't have run away. 1 2 3 4 5

c) You would vow to be more careful next time. 1 2 3 4 5

d) You would think your friend could just get a new dog. 1 2 3 4 5

16. *You attend your colleague's housewarming party and you spill red wine on a new cream-colored carpet, but you think no one notices*.

a) You think your coworker should have expected some accidents at such a big party. 1 2 3 4 5

b) You would stay late to help clean up the stain after the party. 1 2 3 4 5

c) You would wish you were anywhere but at the party. 1 2 3 4 5

d) You would wonder why your coworker chose to serve red wine with the new light carpet. 1 2 3 4 5

Appendix B: Interview protocol (Study 1)

Participant's no:

Interview date:

Time begun:

Time ended:

Duration of interview:

I am Vangelis and I work as a researcher at the University of Bath. I would like to remind you that the interview will be audio-recorded and I will be the only one who listens to it. I have got with me your questionnaire because I am going to ask you some questions in relation to the answers you gave on it. However, there are some things I need you to keep in mind throughout our discussions:

1) As a participant in this study you have several rights. Your participation is entirely voluntary and you are free to decline to answer any questions I will be asking or stop the discussions at any point. There are no right or wrong answers to the questions I will be asking. I want to learn and benefit from your experiences so that I can better understand the relationship between stress and emotions. Therefore, I hope that you will answer the questions in a candid and straightforward way. If there are any questions that you are not comfortable answering I would rather you decline to comment than tell me what you think I might want to hear. So if you would prefer not to answer a question, please simply state "No comment" and I will move straight onto the next question.

2) I will be asking you about your experiences and feelings on stressful life events and hassles that you referred to on the questionnaires. Answering the questions will likely involve you thinking back to events and incidents that have occurred a year or month ago. Since you will have to think back in time, you might not be able immediately remember some things. Take your time as you try to recall the past; pauses are fine. If you cannot remember after trying to think back, then just let me know, but please do not guess.

3) When you are doing this recall, keep in mind that I am interested in your overall experience. So, in your answers you can draw on any and all aspects of your experiences.

4) The interview contains several sections covering various aspects. I will sometimes use the term "stressor" during our discussions; the stressor refers to any life event or hassle which may have made you feel stressed. At the end of each section, there will be an opportunity for you to add anything else that you felt was important and not covered in the questions asked.

5) There are no significant disadvantages and risks of taking part in this study. The interviews will involve disclosure of stressful events and emotions that have happened to you. It is possible that talking about these events may trigger some upset depending on the meaning of those events for you. However, we are interested in everyday stresses encountered in day to day life rather than traumatic events. The researcher will be available whilst the informal interview is conducted.

Do you have any questions about what I have talked about so far? If you have any questions as we go along or if at any time you do not understand what I am asking and need some clarification, please just ask.

Warm-up questions:

Could you please tell me a bit about yourself?

For example, what are you studying?

Why have you been interested in this study?

How have you found your course so far?

Section 1:

Interview questions	Participant prompts
1.1 Why was this life event/hassle stressful for you?	• Information • Meaning

1.2	When did it happen?	• Who was involved? • What triggered it?
1.3	Had you had any previous experience of this life event/hassle before or was it the first time it happened?	• If not, appraisal of the stressor?
1.4	How did you think/evaluate (appraise) this life event/hassle?	• Adaptation/ Maladaptation? • Complexity/ Multiplicity of stressor? • Lack of control? • Unpredictability? • Threat, loss, challenge, harm,
1.5	How did you feel about this life event/hassle?	• Shame, guilt, embarrassment, pride, externalisation, blame, detachment
1.6	Before proceeding to the next section, is there anything else you can add concerning what has just been discussed in this section?	

Section 2:

	Interview questions	Participant prompts
2.1	Could you adjust yourself (adapt) to this life event/hassle?	• Ability/Inability to adapt • Easy or difficult? • Ancient/Modern? • Why?
2.2	How did you deal with this life event/hassle?	• Ability/Inability to cope • Easy or difficult? • Effectiveness? • Ancient/Modern?

	• Why?
2.3	Is there anything else you can add concerning what has just been discussed in this section?

Closing questions:

How do you think the interview went?

Did you feel you could tell your story fully?

Did I lead you or influence your responses in any way?

Is there anything that we have not talked about that you are able to tell me about your experiences?

Have you any comments or suggestions about the interview itself?

Appendix C: Lower-order themes quotes

Health of self:

"That's the idea of that actually destroyed me, I cannot see myself doing whatever I am going to do without sports like during the week …. That event was quite stressful because I lost a part of myself at that point. I cannot deal with it, I have to wait." (15/Participant 4)

"I have got some problems with my upper body, my back and sometimes my chest hurts a lot and I feel my body very heavy. I don't think it's something that you can take medication for this. I don't know what to do." (169/Participant 8)

"It's I think stressful just the idea that of I might need hear something bad, something bad about my health, my physical being and that's why I don't like injuries, I don't like getting down with a flu, I just like being healthy, the whole time. I am full of fear." (222/Participant 4)

"At first I couldn't. You know my life had totally changed the other way around because I was really active. I was going to the gym, I was playing football, I was playing basketball and I had to stop all of these, and my friends and my family were with me and they helped me all the time. But memories and thoughts coming in my mind that it might occur again, or about my face." (91/Participant 17)

"I had some issues with my birth controls, and I had to visit the doctor. I changed method of contraception and now I am ok with it but it was stressful at that time very much. It was very stressful in the sense that it was very emotional for me, because I felt that there was something wrong with me." (56/Participant 3)

Health of others:

"There isn't too much to do about it personally because I think what is done it's done for dementia. We do take him to see a doctor and staff but it's just every six months a check-up." (6/Participant 8)

"My father, he doesn't really have health problems but in my eyes I saw him ageing too fast." (123/Participant 4)

"There is nothing I can do actually. I had to keep confidence, I had to stay strong with it and I put faith in God and that's it." (67/Participant 19)

Bereavement:

"He was one of the reasons I started talking more to my family, to my mother and father." (42/Participant 4)

"I was more mature in a way and relied more on my family, kind of everyone got together and just kind of grieving together." (10/Participant 7)

"I think I adapted quite quickly, I just had to go back to the University and just kind of life went on." (26/Participant 7)

"I wasn't that close with him so the event didn't really impact me at the time and several weeks or months later I just got back to normal. It didn't really affect me at all." (28/Participant 7)

"At the beginning it was difficult to realize it but then we went through it because he was already very ill so it was a matter of time this to be happen and we went through it as a family all together so after a while it was ok, it was bearable." (10/Participant 10)

"Not being alone, crying a lot helped …. I would say that because he was not well before that, that's why I adapted easily." (12/Participant 10)

"From the beginning everyone knew that he was ill for a long time so we were expecting this to happen and I had already started thinking of, so I just tried to cooperate so I have to continue living." (13/Participant 15)

"Actually I think my friends helped me very much. They were every day at home, they were taking me out for rides with the car by the sea and things like that. I was working with children so I had to keep a distance from my feelings in front of the children. I think that it kept the balance." (21/Participant 13)

"It was easier to handle this because it wasn't the first time happening." (28/Participant 14)

"I concentrated more on the good things and not the bad things." (36/Participant 14)

"And then I put myself to work even more which helped at that time, I worked at a job and I had the University as well so I had to concentrate on those. So I think I dealt well. I mean good memories drove me through." (44/Participant 14)

"I had too many projects, so just I just pushed through it I guess." (7/Participant 18)

Relationships:

"I'm trying to moderate the situation and be sure that both sides are happy. It wasn't that difficult but it took some time to find my own way." (60/Participant 6)

"Quite stressful, quite anxiety-provoked, quite anxious the situation to be in, not pleasant but at the same time something that should potentially happen at any point if you have a shared house… but it was just this thing. So I can say it was all right. It wasn't me involved in this situation." (6/Participant 5)

"And I kept saying to her that I am giving her the right amount of time but she didn't understand and I was discussing it with my friends, I didn't know what to do and I started giving her a little bit more time to deal with it." (11/Participant 17)

"I feel a lot more restricted since I started dating her than I was before. I had actually to change myself towards other so that I can make her feel more secure about me, make her feel that I actually do belong to her and I am not flirting around with other girls or just messing in general." (140/Participant 4)

"We tried to discuss and we tried if we wanted to continue being together, we both of us had to be more patient and try to understand each other. So, fortunately we made it." (67/Participant 15)

"Sometimes I just get annoyed because she doesn't get my jokes and that's why I have then to explain and apologise for making them. It's stressful though to keep reminding me that I have to touch her only with gloves." (60/Participant 16)

"This goes again to my girlfriend and the fact that I feel obliged to do things with her even though I am bored, even though I don't wanna see anyone." (280/Participant 4)

"I am not asking for any kind of commitment and so that's why I am quite keen on spending a great deal of time watching TV." (289/Participant 4)

Communication:

"I think I gradually adapted to that and coped with that by talking to each other." (134/Participant 13)

"I just started talking to him to solve this issue." (70/Participant 7)

"It was not difficult to adapt to it; it was weird though because I didn't know what was happening. It was just like my best friend not talking to me. Once we talked, I was good." (45/Participant 8)

"I am trying to talk them on skype and see them quite often actually and I try to take as many days as I can to go back and see them." (119/Participant 13)

"Like talking on skype is the only way that helps me a lot because I can see them." (120/Participant 13)

"Skype talking with my friends and my family couldn't help this time. It was not just enough." (38/Participant 13)

"New language, and completely new friends, also the culture is different, it is quite a lot." (33/Participant 1)

"Thinking of having to adapt to that was quite stressful and I do not really know if I would fit." (31/Participant 1)

"I kind of not getting used to this separation between friends and this end of friendship, and friends apart from life. The realization that your friend just drifts apart." (148/Participant 8)

"When I left they started not being that close to me any more so it was a bit of an issue how to keep in contact. I wanted to have the same contact as I had before but since I wasn't there they obviously preferred like you know to continue their lives alone. I got a bit worried about that and well I discussed with them and they explained me that I left the country so we cannot be as we were before. We have some distance now it's normal that we are not that close any more." (114/Participant 15)

"I mean that I want them in my life, parents and relatives and this makes me feel stress. They are important part of my life. The fact that I am not with my parents right now and there are difficult situations. And once something happens to them it's stressful and affects me." (114/Participant 13)

“I want to see them and learn their news because we have that distance between us and I don’t want to let this distance affect our friendship. Because many times when I am very busy or they are very busy and we have like three or four days without talking to each other, it makes me feel stress. I don’t know how they are or what’s going on in their lives. I think because we have this distance and we don’t see each other that much I feel that I don’t take part in their lives.” (134/Participant 13)

Location:

“I had no one there. No one to tell me where to go, no one to talk to, I had nothing to do. I had no friends. I was all by myself and it was stressful.” (42/Participant 19)

“We are separated by distance basically, so it’s been stressful for me in the sense that we are separated and we can’t have like a physical intimacy, we can’t do things together physically together. There is nothing I can do about it and it doesn’t stop being difficult.” (6/Participant 3)

“I did not find it easy to adapt to this situation. I was weaker and quite attached to her. I didn’t know what to do. I was missing her.” (37/Participant 17)

“It was quite hard having to like saying goodbye to them and then leave them, to move to move to a new country and start again with like new friends and all of that. Of course I didn’t like it. How would I? I didn’t want to leave. I was avoiding it.” (9/Participant 1)

“It was like, the first time that it was so big.” (20/Participant 1)

“I was so emotional and maybe quite sad.” (26/Participant 1)

“‘For me moving country is also a big issue. I don’t think I had adapted as much as I could.” (33/Participant 1)

“It was stressful the transportation and the fact that I didn’t know the city very well, the people here.” (51/Participant 13)

“It was not the movement from my home to a new country stressful, it was the whole process. And living out of the bags the first few days I had a sleeping problem so I couldn’t rest until I had a permanent house.” (26/Participant 16)

“It was everything, the whole process. It was the people in the situation and the environment around me which made it quite stressful and finding a new place to move,

to telling the other people that I was moving out and negotiating with the letting agency and stuff like that because it was so sudden. They didn't expect you to move next week. It was quite stressful really but in terms of physically moving it wasn't too bad." (18/Participant 5)

"So I was physically exhausted and stressed and mentally as well. Thinking about it and actually moving as well made me stressed until it was done." (143/Participant 7)

"It was the procedure like because I was living on campus last year and then I flight back home in summer so there have been a lot of things I had to plan in the sense that I need to pack my stuff, store, find a reliable storage in Bath and because I didn't want to like do the heavy lifting by myself I tried to find people who deliver and collect as well. It was just a lot of logistics to think about and it was very stressful because it was either really expensive or they did either storage or delivery and they didn't do both." (105/Participant 8)

<u>Independent living and maintaining home:</u>

"There was a block in the sink and my landlady said she wouldn't pay for it and it would cost like 200 pounds so I was obviously upset as a student that I had to pay and it just went off for a week and I tried to call the plumber and he was really unreliable so I just felt really powerless to fix the problem because all I could do was to call the plumber, and he didn't call me back." (171/Participant 7)

"I have to do it and I am trying to deal with it. It's an ordinary thing. At first I was on skype with my mother and my sister to give me some guidance." (140/Participant 17)

"It was difficult. I was used to having food prepared and cooked so that wasn't a problem for me. But when I came here it was a bit difficult to start cooking my own food and that was a problem in a sense that I was used in a better quality of food and I had to live with a lower quality." (173/Participant 15)

"I do not really want to cook, so it is just like maybe buying ready meals as a solution." (117/Participant 1)

"I can't cook. It's very irritating and annoying. Like I can cook very few dishes. I get sick of it. So I don't want to eat at home. I prefer to buy take out and that is expensive. It's not that bad but it's just a daily annoyance." (194/Participant 8)

"I had to do it. I was in skype with my mother to give me some specific recipes and the ingredients I have to use. It was not easy." (140/Participant 17)

Organisation of time:

"We had to manage our time appropriately to do all the tasks that we have to do." (88/Participant 1)

"Writing the stuff that I have to do, and the deadlines so that I am organised basically." (92/Participant 1)

"I have done the best I can and put everything and organise things so that I don't leave things at the last minute." (300/Participant 2)

"During my last applications, I started being a bit more organised with this kind of things, just started to put priorities in jobs what I want to apply for, at least more of some others and then I would gather all the materials make sure that I had applied many days before the deadline and would push myself in order to do this." (249/Participant 4)

"Because I am thinking in a state of all or nothing so if I want to be organised, I am a kind of a perfectionist." (44/Participant 10)

"I have got a list of planning out my day and in a sense I am organised I know what to do." (67/Participant 11)

"Trying to improve. I think like since it's necessary, like if you are not organised you cannot cope with this big amount of work, I think pretty much my life now makes me being more organised." (196/Participant 15)

"I am a bit mess so I am trying to organise things up and my different courses. It was a bit difficult but again I found my way of dealing with it like using like posts, separate different subjects." (47/Participant 20)

"I have very limited amount of free time. Sometimes I can't manage to go to German or choir because of the amount of work that I have of the course, so that's a bit stressful too. When I have to skip my extra curriculum activities just to do my coursework." (214/Participant 1)

"The amount of free time is the outcome of having lots of workload. I felt very stressed and I felt that I wanted to do other things." (110/Participant 3)

“That was definitely a hassle because I wasn’t able to effectively apply for jobs, I didn’t have my full, full-day work, a great time in order to see the questions carefully and making an application as I wanted it to be.” (165/Participant 4)

“We don’t have deadlines like spread out necessarily, so we get all of them at the same time.” (32/Participant 6)

“I am totally disorganised and I am in charge of everything in my life. I have to organise my studies, my life, everything basically so I just have to learn to adapt to it. It’s also difficult for me.” (201/Participant 8)

“I don’t follow my time schedule and that stresses me out. Sometimes I lose my track of time and I just go a bit over board.” (110/Participant 11)

“I had to convince myself that I won’t have that much free time left so I tried to be happy with the amount of free time I have.” (144/Participant 15)

“The amount of free time is not that much for you to be able to comply with what you are doing throughout your life especially, it creates a bit of frustration.” (21/Participant 18)

Education:

“Yeah, I could adapt to that situation. I think it does take some time to kind of just realise that you are doing by yourself rather than just doing it being someone else but I think it’s getting better in time.” (159/Participant 2)

“I am going to read this amount of work and I want to get this much done and then normally I achieve it which is quite good.” (39/Participant 6)

“But it really helps me to like write down what I want to achieve like and when, and to go through like that.” (41/Participant 6)

“There wasn’t any straight pressure to do the work. Everyone was working around me so I was feeling that I had to do some work.” (80/Participant 15)

“The student-related obligations are really high here so I had just to do them and deal with them.” (101/Participant 17)

“I was trying to think of it in a positive way so that I don’t get overwhelmed of it, don’t think of it. I managed to organise myself to do all this work. So I just tried to think positively about it but it does get stressful. Dealing with it, to have a positive outlook on it.” (82/Participant 3)

“Continue recruiting people, continue testing, I just kept going and I could see that I was going closely to the end so I just kept going because I knew it would over soon and now it is over.” (45/Participant 5)

“I think it’s probably because of quite a lot at the moment. During last month I have been data collecting for my study. It has been problematic at times, a few various things occurred with the equipment, parts and buttons, participation, recruitment, ethical amendments and stuff like that.” (31/Participant 5)

“I do not really know what to expect like out of the life of the University experience.” (31/Participant 1)

“It was a period of time that I thought that I wouldn’t be able to adapt soon. I thought that I had a big problem in my first exams, in my first few months.” (26/Participant 15)

Exams and assessment:

“We try to start as early as possible just not cram everything in the end. And because it is related to student-obligations we have to and can do it.” (173/Participant 1)

“I tend to do maybe sports, maybe I go out for running just like a break from studying, or maybe I drink some relaxing tea.” (64/Participant 1)

“I just try to calm myself down.” (67/Participant 1)

“Just worked really hard, just made myself do it really. There was not anything else by around it, it was stressful but I knew I had to do it.” (12/Participant 2)

“A lot of revision, taking a lot of breaks between revision and like going for walks, and stuff, and trying like distress that kind of way, and like not force myself to revise because that probably wouldn’t help.” (14/Participant 6)

“I talked to my mom a lot because she was like an outsider because my friends here were also in stress because of the exams. I just wanted to tell her everything and she was just there to listen and I just even told her my plans for few days like tomorrow I

am going to study for this essay and then I am going to revise for this exam, I just talking about it really helped." (132/Participant 7)

"I think that's the only thing I could do, just talking about it. Taking breaks as well, even I don't know just an hour just watching a TV series to get my mind out of it completely, and go to the gym just for a break." (136/Participant 7)

"I think I only do my best, I study hard and I concentrate." (26/Participant 10)

"I think there are times when I cried, and there are times when I stopped working because I didn't want to think about it." (9/Participant 9)

"Yes, I adapted to that situation but it took me some time." (13/Participant 9)

"I tried to start studying earlier this time and to do my courseworks earlier." (59/Participant 8)

"I have been really honest to my parents like during the exams I asked my mum to leave her work these days and just drop me off and pick me up these times." (17/Participant 11)

"I found out that the thing helped me a lot in general was to see what other people are doing. I got some advice from some of my friends so I studied a lot. I think it was my best, I organised my time very well for my first exams period so I did the best I could." (33/Participant 15)

"Well, I just had to take some time off, to relax a few days, I didn't go that much as I wanted to, I had to step back from hanging out with friends, going to the gym, things like that but yeah that was the main coping. What I did was to try to find a balance between things." (15/Participant 20)

"Well, I was studying a lot, I was trying to finish the essays earlier, so I could submit them at that day and I had friends to help me out to finish the essays and that was really helpful." (35/Participant 20)

"It was hard to adapt but what I believe is that with time passes I did find it easier to deal with." (40/Participant 20)

"If you are well-prepared you can pass over any difficulty you find. But I always do that, I can deal with it in a sense that I just have to overcome it." (56/Participant 17)

“It was alright actually. I was so stressed for the first three days. After a while I went into the mood, I started to do more and it went fine, more than I was expecting.” (18/Participant 19)

“Here, after lectures I might stay in the library to do a bit more work and then I go back to eat, and after that I might do a bit more work so it’s basically like I feel that a lot of the time I am staying in my room just doing work, whereas other people might be outside and enjoying. I am trying to do it as quickly as possible.” (225/Participant 1)

“I am still stressed with dealing with this situation but I accepted it more now.” (358/Participant 1)

“Being organised helped me. I feel sometimes that if I for example from the night before if I make a timetable for the next day.” (97/Participant 3)

“I am comfortable giving presentations, like the routine and everything.” (70/Participant 1)

“I just want to get rid of it every time. I don’t like it. I don’t mind how it’s gonna be or what my grade is gonna be. I just want to get rid of it.” (51/Participant 10)

“It is just like being scared of like not performing that well as I should do and knowing that I am capable of doing like well if it does not go as planned, then it is like quite stressful I think.” (60/Participant 1)

“Meeting deadlines was quite difficult because thinking about the work made me demotivated me and made me incapable of working.” (159/Participant 4)

“There, because of the work loads, at some point I told myself like it’s not worth it studying any more. I am not going to lose myself in order to get into a good University so even if I got not the marks that I wanted not even close studying here that was very stressful, it was actually stressful before the exams and till the point that it’s not worth it studying anymore.” (10/Participant 11)

“Although I believe that setting goals are very important for progress and improvement when I set goals I tend to be all over the place and not concentrating on the specific goals that I want to, so that’s why it is stressful for me.” (34/Participant 10)

“The fact that I don’t know what I want to do in life and I have no passion on what I am doing at the moment which is quite sad. Like it is very stressful when other people ask

you. I don't know what to do in the future, in my career and it's all this existential in my mind." (125/Participant 8)

"Because most of the times I am a kind of person who leaves things to the last minute. So whenever I have a deadline I feel stressed." (170/Participant 13)

"Trying to set deadlines for myself and keep them and try to have a specific schedule every day of what I have to do today." (192/Participant 13)

"I just force myself to be organised and then just do it in blocks because I leave it to the last minute. Then I just have 3-4 days before the deadline I just have to work through them and it's really not enjoyable at all and really stressful but it seems that I have not completely learnt from that." (80/Participant 16)

Work-related problems:

"Sometimes, I was getting overwhelmed but then I just I find ways to motivate myself to work. I do some exercise which helps me, like take my mind off work which is good. I do some yoga which is really good to relax myself. I tried to take breaks for a while, to relax, listen to music, things like that." (33/Participant 3)

"Definitely, I adapted to that life event." (38/Participant 3)

"I was able to cope with it. Just in time like I worked hard and then I realised I wasn't any worse than anyone else." (36/Participant 2)

"No, it was literally one more than the other. I couldn't do both so like when I am at the Uni I can't work. I didn't quit my job I like left it so I can go back but not at the moment." (104/Participant 2)

Future planning:

"I knew that I had to get a job and start working, earning any money but just couldn't find any for ages. So that's stressed me out because I didn't have a lot of money and I know where that takes me on. So I have got a bit stressful about that." (76/Participant 2)

"The longer it went on without having one I did get more and more stressed because time was pressing on and I didn't have that long I felt pressure to find out quickly." (81/Participant 2)

"When I actually started applying for jobs I thought that it would be quite easy. However, when I came face to face with the cruel world of commercial awareness and the industrial market I saw that it is actually quite different and difficult and it doesn't really matter if you are good in any kind of things if you can't make other people see it." (64/Participant 4)

"At some point, I thought that must be something wrong with me and this actually led me to be highly demotivated towards applying for other jobs or going out with friends." (71/Participant 4)

"I think it's more about the idea that's I would be a failure in my life." (73/Participant 4)

"It took me a while, more than six months to understand this kind of concept and it still appears quite scary because if I find a job it doesn't really depend upon me but it's a decision that relies upon the person and as I don't have any control over him/her, I think I still face some problems with getting job whenever I wanted it." (83/Participant 4)

"When looking for jobs, it was a very anxious and stressful period of my life thinking what I should do because I don't want to go into Psychology. So I was just very constantly feeling very stressed thinking about it, getting really upset over it. I think I was very upset for one or two months. I didn't really do anything to cope with it. I just got over it. I had to deal with this uncertainty." (86/Participant 8)

"The fact that I couldn't find a job it was quite stressful and depressing because I wanted to do something but I couldn't find anything." (85/Participant 13)

"As an international student, for us it's so hard to find a job and at the same time if I won't find a job I can't go back to my country because my country has some problems over there." (28/Participant 19)

<u>Social issues:</u>

"So like a lot of shooting around the world of like unarmed black people in the news." (144/Participant 6)

"At the moment there are a lot of crises, and wars, and tragedies and I think that affects people when they cannot do anything about it. You just hear about these and you can't do anything. I would like to help but I cannot." (62/Participant 9)

"I just can't adapt. There are shootings and bombings in my country at this time we are talking and I don't know if my family is alive." (10/Participant 19)

Political issues:

"It's more about feminism issues and that people keep on ignoring it which is annoying." (142/Participant 6)

"And then we have like the general elections coming up because it's quite stressed like worrying about who is going to be running the country." (151/Participant 6)

"I can't just deal with these issues and why we are spending our energy on inappropriate things and not in the most important ones. It's annoying and frustrating. Just tell me how to deal with these." (10/Participant 6)

Environmental issues:

"I don't deal with. I just cry. I am lying and crying because I can't sleep but no I don't deal with it very well and we have spoken to people about it but they don't do anything really. They don't listen to us and they don't stop being noisy and stuff." (203/Participant 2)

"The weather impacts my mood when it's very cold and wet. I don't like it. I get depressed and I think it's nicer when the weather is nice and you don't feel so stressed. I am dealing with this by making plans for the summer." (57/Participant 9)

"I have accepted it. I have to accept it in my everyday life. Look at it. We are in summer now and it's raining and it's like winter." (119/Participant 19)

"Whatever the weather is, it's something not to consider about it." (120/Participant 19)

Opportunity to participate in sport:

"I do pentathlon. So, it's quite a lot sport and training and stuff like that. I think it's just quite hard to combine lectures and everything at University like finding the time to fit it all in and if you don't have time to do something you feel you are behind everyone else. I have to manage my time a bit better so I have to fit all in, but sometimes you just can't." (174/Participant 2)

"It gets physically strains and injuries quite usually because of my accident I need to be in great physical shape at all times in order not to get injured at least at these particular points in my knee." (184/Participant 4)

"I knew that coming to a good University to study this results to not have so much free time so. I tried for example to go to the gym beforehand and I didn't like to do sports on my own, I prefer doing like team sports." (135/Participant 15)

Factors resisting exercise:

"Then I came to a point where I actually found myself weakened which was last year when I told myself I can't actually stop smoking even if I want to. Now I can't stop smoking and I think it has affected my life, it has affected my brain, my concentration." (93/Participant 14)

"Every time I say I won't smoke today and I will go for running, but at the end of the day I feel so tired, I do really wanna smoke." (94/Participant 19)

"I have let myself physically off more than a year and that means if I wanted to participate in a like sport just for fun maybe not giving my all during this workout, that still means I will face some problems with injuring myself and I think I injured my knee five times this year which is a great deal of pain because I don't realise I work out that much." (186/Participant 4)

Physical appearance:

"I feel bad because I put on lots of weight. But at the same time, it's kind of making my mood and I have combined eating with watching anime." (197/Participant 4)

“I just accept it that I don’t like certain things about myself so if I accept them it means that I love my flaws.” (58/Participant 10)

“I had some eating disorders and that’s why I had to take drugs which generally affected my health, but I feel okay with my body.” (51/Participant 9)

“I used to be over-weight that’s the thing and I lost about 16 kilograms and there is always the uncertainty. But there is always an uncertainty and the fear. I am afraid not going back to that, I don’t stop eating and I don’t exercise excessively. I just worry about it.” (162/Participant 8)

Financial concerns:

“I have asked a friend to borrow money because I had some problems with my bank account and that was really stressful, even to pay it back as soon as possible.” (283/Participant 7)

“It’s really stressful when you have to deal with little money. And this makes you think about the future. I can’t cope with it and asking friends to help you it’s not a solution if you are aware that you can’t pay them back.” (10/Participant 10)

“In terms of having enough money to pay my loan, to pay my rent, so that’s very stressful because sometimes I don’t have any solutions so then I am getting upset and I have to ask people for help and I don’t want to do this which makes me thinking of the future and pushing me under pressure.” (21/Participant 9)

“I think saving money is a bit stressful.” (193/Participant 1)

“It took me a lot of time to adapt to this. I obviously prioritise education and necessities which then left not much money for extras. So generally it’s about budgeting and being concerned about money. It’s just sort of very tough trying to budget everything.” (81/Participant 12)

Visa issues and background check requirements:

“It was my first time to apply for criminal records certificate and it took me about two months to send all the documents. I think that was quite stressful. I couldn’t adjust myself to this stress.” (249/Participant 1)

“I can’t stay in this country anymore, my visa expires and I have to go back home, I had no place to live in so I had to find a job and it was so hard.” (31/Participant 19)

Appendix D: Evidence of initial designation of psychosocial stressors as ancient and modern in relation to adaptation and coping

Items	Quotes	Coping	Outcome	Stressor designation
LE14. A close family friend or relative died (e.g. aunt, uncle, grandparent, cousin, etc.)	'He was one of the reasons I started talking more to my family, to my mother and father.'	Adaptive (social support) Meaning-based coping: positive reappraisal and spiritual beliefs and experiences	Favourable (emotion outcome)	Ancient (?) *strong evidence?*
	'I was more mature in a way and relied more on my family, kind of everyone got together and just kind of grieving together.'	Adaptive (social support, active coping)	Favourable	
	'I think I adapted quite quickly, I just had to go back to the University and just kind of life went on.'	Adaptive (active coping)	Favourable	

	‘I wasn’t that close with him so the event didn’t really impact me at the time and several weeks or months later I just got back to normal. It didn’t affect me much.’	Adaptive (acceptance)	Favourable	
	‘At the beginning it was difficult to realize it but then we went through it because he was already very ill so it was a matter of time this to be happen and we went through it as a family all together so after a while it was ok, it was bearable.’	Adaptive (social support)	Favourable	
	‘Not being alone, crying a lot helped. I would say that because he was not well before that, that’s why I adapted easily.’	Adaptive (active coping, venting of emotions)	Favourable	
	‘From the beginning everyone knew that he was ill for a long time so we were expecting this to happen and I had already	Adaptive (acceptance, planning)	Favourable	

	started thinking of, so I just tried to cooperate so I have to continue living.'			
	'Actually I think my friends helped me very much. They were every day at home, they were taking me out for rides with the car by the sea and things like that. I was working with children so I had to keep a distance from my feelings in front of the children. I think that it kept the balance.'	Adaptive (social support) Meaning-based coping: revising goals and planning goal-directed problem-focused coping	Favourable (emotion outcome)	
	'It was easier to handle this because it wasn't the first time happening.'	Adaptive (acceptance)	Favourable	
	'I concentrated more on the good things and not the bad things.'	Adaptive (active coping)	Favourable	
	'And then I put myself to work even more which helped at that time, I worked at a	Adaptive (active coping)	Favourable	

	job and I had the University as well so I had to concentrate on those. So I think I dealt well. I mean good memories drove me through.'			
	'I had too many projects, so just I just pushed through it I guess.'	Adaptive (active coping)	Favourable	
H8. Family/student-related obligations	'Again, I tried not to talk about it, I sometimes try to lie and it's more about a lie that assures in not getting a lot of nagging during the day.'	Adaptive (active coping)	Favourable	Ancient (?) *strong evidence?*
	'I am going to read this amount of work and I want to get this much done and then normally I achieve it which is quite good.'	Adaptive (planning)	Favourable	
	'But it really helps me to like write down what I want to achieve like and when, and to go through like that.'	Adaptive (planning)	Favourable	

	‘There wasn’t any straight pressure to do the work. Everyone was working around me so I was feeling that I had to do some work.’	Adaptive (active copping, social support)	Favourable	
	‘The student-related obligations are really high here so I had just to do them and deal with them.’	Adaptive	Unfavourable (no evidence)	
LE39. You have been unemployed and seeking work for a month or more	‘I knew that I had to get a job and start working, earning any money but just couldn’t find any for ages. So that’s stressed me out because I didn’t have a lot of money and I know where that takes me on. So I have got a bit stressful about that.’	Maladaptive	Unfavourable	Modern (?) *strong evidence?*
	‘The longer it went on without having one I did get more and more stressed because	Maladaptive	Unfavourable	

	time was pressing on and I didn't have that long I felt pressure to find out quickly.'			
	'When I actually started applying for jobs I thought that it would be quite easy. However, when I came face to face with the cruel world of commercial awareness and the industrial market I saw that it is actually quite different and difficult and it doesn't really matter if you are good in any kind of things if you can't make other people see it.'	Maladaptive	Unfavourable	
	'At some point, I thought that must be something wrong with me and this actually led me to be highly demotivated towards applying for other jobs or going out with friends.	Maladaptive	Unfavourable	

	‘It took me a while, more than six months to understand this kind of concept and it still appears quite scary because if I find a job it doesn’t really depend upon me but it’s a decision that relies upon the person and as I don’t have any control over him/her, I think I still face some problems with getting job whenever I wanted it.’	Maladaptive	Unfavourable	
	‘When looking for jobs, it was a very anxious and stressful period of my life thinking what I should do because I don’t want to go into Psychology. So I was just very constantly feeling very stressed thinking about it, getting really upset over it. I think I was very upset for one or two months. I didn’t really do anything to cope with it. I just got over it. I had to deal with this uncertainty.’	Maladaptive	Unfavourable	

	‘The fact that I couldn’t find a job it was quite stressful and depressing because I wanted to do something but I couldn’t find anything.’	Maladaptive	Unfavourable	
	‘As an international student, for us it’s so hard to find a job and at the same time if I won’t find a job I can’t go back to my country because my country has some problems over there.’	Maladaptive	Unfavourable	
LE50, 51. You moved to Bath from Europe/overseas	‘I had no one there. No one to tell me where to go, no one to talk to, I had nothing to do. I had no friends. I was all by myself and it was stressful.’	Maladaptive	Unfavourable	Modern (?) *strong evidence?*
	‘For me moving country is also a big issue. I don’t think I had adapted as much as I could.’	Maladaptive	Unfavourable	

	‘It was stressful the transportation and the fact that I didn’t know the city very well, the people here.’	Maladaptive	Unfavourable	
	‘It was not the movement from my home to a new country stressful, it was the whole process. And living out of the bags the first few days I had a sleeping problem so I couldn’t rest until I had a permanent house.’	Maladaptive	Unfavourable	
LE52. You moved house in Bath	‘It was everything, the whole process. It was the people in the situation and the environment around me which made it quite stressful and finding a new place to move, to telling the other people that I was moving out and negotiating with the letting agency and stuff like that because it was so sudden. They didn’t expect you to	Maladaptive	Unfavourable	Modern (?) *strong evidence?*

	move next week. It was quite stressful really but in terms of physically moving it wasn't too bad.'			
	'So I was physically exhausted and stressed and mentally as well. Thinking about it and actually moving as well made me stressed until it was done.'	Maladaptive	Unfavourable	
	'It was the procedure like because I was living on campus last year and then I flight back home in summer so there have been a lot of things I had to plan in the sense that I need to pack my stuff, store, find a reliable storage in Bath and because I didn't want to like do the heavy lifting by myself I tried to find people who deliver and collect as well. It was just a lot of logistics to think about and it was very stressful because it was either really	Maladaptive	Unfavourable	

	expensive or they did either storage or delivery and they didn't do both.'			
H4. Time spent with family or friends	'New language, and completely new friends, also the culture is different, it is quite a lot.'	Maladaptive	Unfavourable (no evidence)	Modern (?) *strong evidence?*
	'Thinking of having to adapt to that was quite stressful and I do not really know if I would fit.'	Maladaptive	Unfavourable	
	'I kind of not getting used to this separation between friends and this end of friendship, and friends apart from life. The realization that your friend just drifts apart.'	Maladaptive	Unfavourable	
	'When I left they started not being that close to me any more so it was a bit of an issue how to keep in contact. I wanted to	Maladaptive	Unfavourable	

	have the same contact as I had before but since I wasn't there they obviously preferred like you know to continue their lives alone. I got a bit worried about that and well I discussed with them and they explained me that I left the country so we cannot be as we were before. We have some distance now it's normal that we are not that close any more.'			
	'I mean that I want them in my life, parents and relatives and this makes me feel stress. They are important part of my life. The fact that I am not with my parents right now and there are difficult situations. And once something happens to them it's stressful and affects me.'	Maladaptive	Unfavourable	

	‘I want to see them and learn their news because we have that distance between us and I don’t want to let this distance affect our friendship. Because many times when I am very busy or they are very busy and we have like three or four days without talking to each other, it makes me feel stress. I don’t know how they are or what’s going on in their lives. I think because we have this distance and we don’t see each other that much I feel that I don’t take part in their lives.’	Maladaptive	Unfavourable	
LE16. There has been increasing serious arguments with your partner	‘And I kept saying to her that I am giving her the right amount of time but she didn’t understand and I was discussing it with my friends, I didn’t know what to do and I started giving her a little bit more time to deal with it.’	Adaptive (active coping, social support)	Favourable	Ancient (?) *weak evidence*

LE31. There has been a serious increase in arguments or problems with someone who lives at home (excluding your partner)	'Quite stressful, quite anxiety-provoked, quite anxious the situation to be in, not pleasant but at the same time something that should potentially happen at any point if you have a shared house… but it was just this thing. So I can say it was all right. It wasn't me involved in this situation.'	Adaptive (acceptance)	Favourable	Ancient (?) *weak evidence*
LE47. You had a big change in the people, duties or responsibilities in your department/work	'I think I adapted quite quickly in the situation although it is just like you have to do everything by yourself so as to cope. It is okay'	Adaptive (active coping)	Favourable	Ancient (?) *weak evidence*
H13. The nature of your course	'We try to start as early as possible just not cram everything in the end. And because it is related to student-obligations we have to and can do it.'	Adaptive (planning, active coping)	Favourable	Ancient (?) *weak evidence*
LE2. You had a serious illness, injury or operation	'That's the idea of that actually destroyed me, I cannot see myself doing whatever I	Maladaptive	Unfavourable	Modern (?) *weak evidence*

needing hospitalisation, or a month or more off university	am going to do without sports like during the week.' 'That event was quite stressful because I lost a part of myself at that point. I cannot deal with it, I have to wait.'	Maladaptive	Unfavourable	
LE18. You have been separated from your partner for more than a month because of personal difficulties	'We had been separated from each other for about six months… I did not find it easy to adapt to this situation. I was weaker and quite attached to her. I didn't know what to do. I was missing her.'	Maladaptive	Unfavourable	Modern (?) *weak evidence*
LE19. You have been separated from your partner for more than a month (for reasons other than relationship difficulties)	'We are separated by distance basically, so it's been stressful for me in the sense that we are separated and we can't have like a physical intimacy, we can't do things together physically together. There is nothing I can do about it and it doesn't stop being difficult.'	Maladaptive	Unfavourable	Modern (?) *weak evidence*

H18. Enough money for education	'It's really stressful when you have to deal with little money. And this makes you think about the future. I can't cope with it and asking friends to help you it's not a solution if you are aware that you can't pay them back.'	Maladaptive	Unfavourable	Modern (?) *weak evidence*

Appendix E: Questionnaires (Study 2)

Life Events Inventory

Listed below are a number of events that commonly occur in everyday life. Please read each statement and circle how stressful it was for you on a scale from 1-7 in the last year. Some life events will not be at all stressful, others may be moderately stressful, while others may be very or extremely stressful. If the life event has not happened during the last year, please circle the number 0. Do not take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

0	1	2	3	4	5	6	7
Not Happened	Not at all Stressful	Mildly Stressful		Moderately Stressful	Very Stressful		Extremely stressful

Life event	*Level of distress*							
1. You had a minor illness or injury like one needing a visit to a doctor, (or couple of days off work)	0	1	2	3	4	5	6	7
2. You had a serious illness, injury or operation needing hospitalization, (or a month or more off work)	0	1	2	3	4	5	6	7
3. A close relative had a serious illness (from which they did not die)	0	1	2	3	4	5	6	7
4. Your partner died	0	1	2	3	4	5	6	7
5. A child of yours died	0	1	2	3	4	5	6	7
6. A close family member or relative died (e.g. sibling, cousin, etc.)	0	1	2	3	4	5	6	7
7. You got married	0	1	2	3	4	5	6	7
8. There has been increasing serious arguments with your partner	0	1	2	3	4	5	6	7

9. There has been a marked improvement in the way you and your partner are getting on	0	1	2	3	4	5	6	7
10. You have been separated from your partner for more than a month because of personal difficulties	0	1	2	3	4	5	6	7
11. You have been separated from your partner for more than a month (for reasons other than personal difficulties)	0	1	2	3	4	5	6	7
12. You have got back together again after a separation due to personal difficulties	0	1	2	3	4	5	6	7
13. You have been divorced	0	1	2	3	4	5	6	7
14. A child of yours became engaged	0	1	2	3	4	5	6	7
15. A child of yours married with your approval	0	1	2	3	4	5	6	7
16. A child of yours married without your approval	0	1	2	3	4	5	6	7
17. A child of yours left home for reasons other than marriage	0	1	2	3	4	5	6	7
18. A child of yours entered the armed services	0	1	2	3	4	5	6	7
19. You had increasing arguments or difficulties with your partner	0	1	2	3	4	5	6	7
20. A new person came to live in your household (apart from a new baby)	0	1	2	3	4	5	6	7
21. There has been a marked improvement in the way you get on with someone close to you (excluding your partner)	0	1	2	3	4	5	6	7
22. You have been separated from someone important to you (other than close family members)	0	1	2	3	4	5	6	7
23. There has been a serious increase in arguments or problems with someone who lives at home (excluding your partner)	0	1	2	3	4	5	6	7

24. There have been serious problems with a close friend, neighbor, or relative not living at home	0	1	2	3	4	5	6	7
25. You started a course (i.e. occupational training course)	0	1	2	3	4	5	6	7
26. You started a new hobby	0	1	2	3	4	5	6	7
27. Your own business failed	0	1	2	3	4	5	6	7
28. You were sacked	0	1	2	3	4	5	6	7
29. You retired	0	1	2	3	4	5	6	7
30. You were downgraded at work	0	1	2	3	4	5	6	7
31. You were promoted at work	0	1	2	3	4	5	6	7
32. You began to have troubles with your boss/supervisor	0	1	2	3	4	5	6	7
33. You had a big change in the people, duties or responsibilities in your work	0	1	2	3	4	5	6	7
34. You started in a completely different type of job	0	1	2	3	4	5	6	7
35. You had holidays for a week or more	0	1	2	3	4	5	6	7
36. You moved to Bath from elsewhere in the UK/Europe	0	1	2	3	4	5	6	7
37. You moved house in Bath	0	1	2	3	4	5	6	7
38. You had moderate financial difficulties	0	1	2	3	4	5	6	7
39. You had a major financial crisis	0	1	2	3	4	5	6	7
40. You are much better off financially	0	1	2	3	4	5	6	7
41. You were involved in a traffic accident that carried serious risk to the health or life of yourself or others	0	1	2	3	4	5	6	7

42. You had minor difficulties with the police or the authorities (which has not required a court appearance, e.g. fine, etc.)	0	1	2	3	4	5	6	7
43. You had more important problems with the police or the authorities (leading to a court appearance)	0	1	2	3	4	5	6	7
44. You had a jail sentence or were in prison	0	1	2	3	4	5	6	7
45. You were involved in civil law suit (e.g. divorce, debt, custody, etc.)	0	1	2	3	4	5	6	7
46. Something you valued or cared for greatly was stolen or lost	0	1	2	3	4	5	6	7
47. Anything else (Please rate and describe below)	0	1	2	3	4	5	6	7

Hassles Scale

Below is a list of everyday events which people might find stressful. Please think how much of a hassle each item was for you in the last month. Circle one number on the right-hand side of the page for each item. Do not take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

0	1	2	3
None/Not applicable	Somewhat	Quite a bit	A great deal

1. Your child(ren)	0	1	2	3
2. Other relative(s)	0	1	2	3
3. Your partner	0	1	2	3
4. Time spent with family or friends	0	1	2	3
5. Health or well-being of a family member	0	1	2	3
6. Technology	0	1	2	3
7. Internet access	0	1	2	3

8. Family-related obligations	0 1 2 3
9. Your friend(s)	0 1 2 3
10. Fellow workers	0 1 2 3
11. Your supervisor/employer	0 1 2 3
12. The nature of your work	0 1 2 3
13. Your work load	0 1 2 3
14. Feeling secured	0 1 2 3
15. Enough money for necessities (e.g. food, clothing, health care, transportation)	0 1 2 3
16. Enough money for emergencies	0 1 2 3
17. Enough money for extras (e.g. entertainment, recreation, vacations)	0 1 2 3
18. Financial care for someone who does not live with you	0 1 2 3
19. Investments	0 1 2 3
20. Your smoking	0 1 2 3
21. Your drinking	0 1 2 3
22. Mood-altering drugs	0 1 2 3
23. Your physical appearance	0 1 2 3
24. Physical exercise	0 1 2 3
25. Your medical care	0 1 2 3
26. Your health	0 1 2 3
27. Your physical abilities	0 1 2 3
28. The weather	0 1 2 3
29. News events	0 1 2 3
30. Your environment (e.g. quality of air, noise level, greenery)	0 1 2 3
31. Political or social issues	0 1 2 3

32. Your neighborhood (e.g. neighbors, setting)	0	1	2	3
33. Conserving (e.g. gas, electricity, water, gasoline, etc.)	0	1	2	3
34. Pets	0	1	2	3
35. Cooking	0	1	2	3
36. Housework	0	1	2	3
37. Home repairs	0	1	2	3
38. Yardwork	0	1	2	3
39. Car maintenance	0	1	2	3
40. Taking care of paperwork (e.g. paying bills, filling out forms)	0	1	2	3
41. Home entertainment (e.g. TV, music, reading)	0	1	2	3
42. Recreation and entertainment outside the home (e.g. movies, sports, eating out, walking)	0	1	2	3
43. Eating (at home)	0	1	2	3
44. Church or community organisations	0	1	2	3
45. Legal matters	0	1	2	3
46. Amount of free time	0	1	2	3
47. Being organised	0	1	2	3
48. Misplacing or losing things	0	1	2	3
49. Your GP	0	1	2	3
50. Troubling thoughts about your future	0	1	2	3
51. Thoughts about death	0	1	2	3
52. Social commitments	0	1	2	3
53. Concerns about owing money	0	1	2	3
54. Being lonely	0	1	2	3
55. Concerns about the meaning of life	0	1	2	3

56. Trouble relaxing/resting/sleeping	0 1 2 3
57. Trouble making decisions	0 1 2 3
58. Side effects of medication	0 1 2 3
59. Problems seeing or hearing	0 1 2 3
60. Concerns about retirement	0 1 2 3
61. Regrets over past decisions	0 1 2 3
62. Crime	0 1 2 3
63. Anything else (Please rate and describe below)	0 1 2 3

Perceived Stress Scale

Same with study one.

Emotions scale

Below is a list of statements describing feelings or experiences that you may have from time to time or that are familiar to you because you have had these feelings and experiences for a long time. These are statements of feelings and experiences that are generally negative in some way. Some people will seldom or never have had many of these feelings or experiences. Everyone has had some of these feelings at some time, but if you find that these statements describe the way you feel a good deal of the time, it can be painful just reading them. Try to be as honest as you can in responding. Read each statement carefully and circle the number to the right of each item that indicates the frequency with which you find yourself feeling or experiencing what is described in the statement. Please do not omit any item.

0	1	2	3	4
Never	Seldom	Sometimes	Frequently	Almost always

1.	I feel like I am never quite good enough.	0 1 2 3 4
2.	I feel somehow left out.	0 1 2 3 4

3. I think that people look down on me.	0 1 2 3 4
4. Compared to other people I feel like I somehow never measure up.	0 1 2 3 4
5. I scold myself and put myself down.	0 1 2 3 4
6. I feel insecure about others' opinions of me.	0 1 2 3 4
7. I see myself as being very small and insignificant.	0 1 2 3 4
8. I feel as I am somehow defective as a person, like there is something basically wrong with me.	0 1 2 3 4
9. I have an overpowering fear that my faults will be revealed in front of others.	0 1 2 3 4
10. I feel intensely inadequate and full of self-doubt.	0 1 2 3 4
11. I have this painful gap within me that I have not been able to fill.	0 1 2 3 4
12. There are different parts of me that I try to keep secret from others.	0 1 2 3 4
13. I feel empty and unfulfilled.	0 1 2 3 4
14. When I compare myself to others I am just not as important.	0 1 2 3 4
15. My loneliness is more like emptiness.	0 1 2 3 4
16. I always feel like there is something missing.	0 1 2 3 4
17. I really do not know who I am.	0 1 2 3 4
18. I replay painful events over and over in my mind until I feel overwhelmed.	0 1 2 3 4
19. At times I feel like I will break into a thousand pieces.	0 1 2 3 4
20. I feel as if I have lost control over my body functions and my feelings.	0 1 2 3 4
21. Sometimes I feel no bigger than a pea.	0 1 2 3 4

22. At times I feel so exposed that I wish the earth would open and swallow me. 0 1 2 3 4

23. I become confused when my guilt is overwhelming because I am not sure why I feel guilty. 0 1 2 3 4

24. I seem always to be either watching myself or watching others watch me. 0 1 2 3 4

25. I see myself striving for perfection only to continually fall short. 0 1 2 3 4

26. I think others are able to see my defects. 0 1 2 3 4

27. When bad things happen to me I feel like I deserve it. 0 1 2 3 4

28. Watching other people feels dangerous to me, like I might be punished for that. 0 1 2 3 4

29. I can't stand to have anyone look directly to me. 0 1 2 3 4

30. It is difficult for me to accept a compliment. 0 1 2 3 4

31. I could beat myself over the head with a club when I make a mistake. 0 1 2 3 4

32. When I feel embarrassed, I wish I could go back in time and avoid that event. 0 1 2 3 4

33. Suffering degradation and distress seems to fascinate and excite me. 0 1 2 3 4

34. I feel dirty and messy like no one should ever touch me or they'll be dirty too. 0 1 2 3 4

35. I would like to shrink away when I make a mistake. 0 1 2 3 4

1	2	3	4	5
Strongly agree	Agree	Undecided	Disagree	Strongly disagree

36. I have made a lot of mistakes in my life. 1 2 3 4 5

37. If I could do certain things over again, a great burden would be lifted from my shoulders. 1 2 3 4 5

38. I have never felt great remorse or guilt. 1 2 3 4 5

39. There is something in my past that I deeply regret. 1 2 3 4 5

40. Frequently, I just hate myself for something I have done. 1 2 3 4 5

41. My parents were very strict with me. 1 2 3 4 5

42. I often feel “not right” with myself because of something I have done. 1 2 3 4 5

43. If I could live my life over again, there are a lot of things I would do differently. 1 2 3 4 5

44. Guilt and remorse have been a part of my life for as long as I can recall. 1 2 3 4 5

45. Sometimes, when I think about certain things I have done, I almost get sick. 1 2 3 4 5

46. I do not believe that I have made a lot of mistakes in my life. 1 2 3 4 5

47. I often have a strong sense of regret. 1 2 3 4 5

48. I worry a lot about things I have done in the past. 1 2 3 4 5

49. There are a few things in my life hat I regret having done. 1 2 3 4 5

50. I sometimes have trouble eating because of things I have done in the past. 1 2 3 4 5

51. Sometimes I can't stop myself from thinking about things I have done which I consider to be wrong. 1 2 3 4 5

52. I never have trouble sleeping. 1 2 3 4 5

53. Guilt is not a particular problem for me. 1 2 3 4 5

54. There is nothing in my past that I deeply regret. 1 2 3 4 5

55. If I had my life to begin over again, I would change very little, if anything. 1 2 3 4 5

56. I believe in a strict interpretation of right and wrong. 1 2 3 4 5

57. I have always believed strongly in a firm set of moral-ethical principles.	1 2 3 4 5
58. My goal in life is to enjoy it rather than to live up to some abstract set of moral principles.	1 2 3 4 5
59. There are only a few things I would never do.	1 2 3 4 5
60. My ideas of right and wrong are quite flexible.	1 2 3 4 5
61. There are many things I would just never do because I believe they are wrong.	1 2 3 4 5
62. Morality is not as "black and white" as many people would suggest.	1 2 3 4 5
63. In certain circumstance, there is almost nothing I wouldn't do.	1 2 3 4 5
64. I would rather die than commit a serious act of wrongdoing.	1 2 3 4 5
65. I feel a strong need to live up to my moral values.	1 2 3 4 5
66. I believe that you can't judge whether something is right or wrong without knowing the motives of the people involved and the situation in which they are acting.	1 2 3 4 5
67. I never worry about what I do; I believe life will take care of itself.	1 2 3 4 5
68. I am immediately aware of it when I have done something morally wrong.	1 2 3 4 5
69. What is right or wrong depends on the situation.	1 2 3 4 5
70. I believe that moral values are more absolute.	1 2 3 4 5

Health and Illness Scale

The questions in this scale ask you about whether you have experienced any common cold/flu symptoms during the last month. Please in each case circle your response which represents how mild, moderate, severe, or not the symptom was. Do not take too long

over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

1. *Have you experienced any cold/flu in the last month?*

1. Yes 2. No

If yes, please circle the severity degree of the following cold/flu symptoms that you have experienced:

1. None 2. Mild 3. Moderate 4. Severe

2. Fever	1 2 3 4
3. Chills	1 2 3 4
4. Muscle pains, joint pain	1 2 3 4
5. Watery eyes	1 2 3 4
6. Runny nose	1 2 3 4
7. Sneezing	1 2 3 4
8. Sore throat	1 2 3 4
9. Cough	1 2 3 4
10. Chest pain/congestion	1 2 3 4
11. Nasal stuffiness/obstruction/congestion	1 2 3 4
12. Postnasal discharge	1 2 3 4
13. Rinus pain	1 2 3 4
14. Hoarseness	1 2 3 4
15. Sputum, mucus secretion	1 2 3 4
16. Malaise	1 2 3 4
17. Headache	1 2 3 4
18. Earache	1 2 3 4

19. Gastrointestinal discomfort 1 2 3 4

20. *About how long did the cold/flu last?*

1. A day 2. Two days 3. Three days 4. Five days 5. A week 6. Two weeks or more

21. *Do you have any other on-going conditions and/or current/acute symptoms?*

Appendix F: Interview protocol (Study 2)

Section 1:

Interview questions	Participant prompts
1.1 Why was this life event/hassle stressful for you?	• Information • Meaning
1.1.1 When did it happen?	• Who was involved? • What triggered it?
1.2 How did you feel about this life event/hassle?	• Shame, guilt; blame • Why?
1.2.1 Before proceeding to the next section, is there anything else you can add concerning what has just been discussed in this section?	

Section 2:

Interview questions	Participant prompts
1.3 How did you think/evaluate (appraise) this life event/hassle?	• Adaptation/ Maladaptation? • Complexity/ Multiplicity of stressor? • Lack of control? • Unpredictability? • Threat, loss, challenge, harm, stressful • Benign, irrelevant • Outcomes? • Severity?

1.4	How did you deal with this life event/hassle?	• Ability/Inability to cope • Easy or difficult? • Effectiveness? • Ancient/Modern? • Why?
1.5	Had you had any previous experience of this life event/hassle before or was it the first time it happened?	• If not, appraisal of the stressor?
1.6	Had this life event/hassle affected your health?	• Severity of stress on physical health? • Common cold symptoms? • Any ongoing chronic conditions?
1.6.1	Is there anything else you can add concerning what has just been discussed in this section?	

Section 3:

	Interview questions	Participant prompts
1.7	How do you believe that you would think about and cope with this life event/hassle, if you experienced it in a younger age?	• Appraisal of stressor? • Adaptation and coping? • Ancient/Modern?
1.7.1	Is there anything else you can add concerning what has just been discussed in general?	

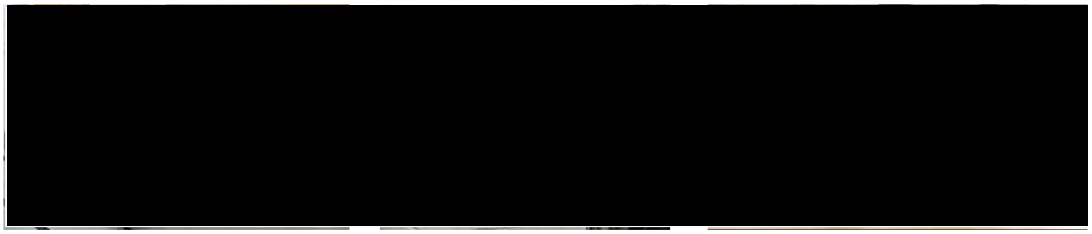
Appendix G: Design of Study 3

Implicit measure's stimulus items

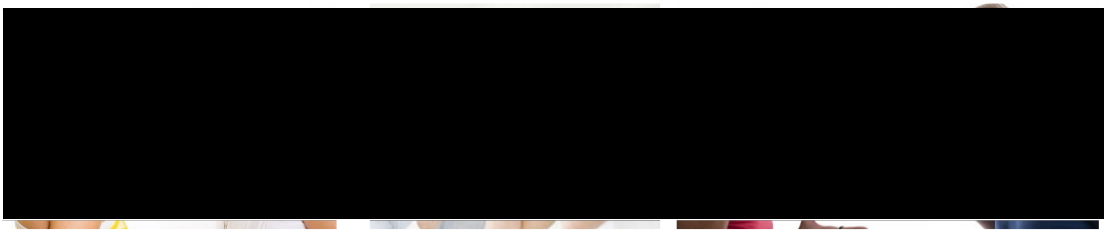
Old problems (ancient stressors):

Death/bereavement

Movement



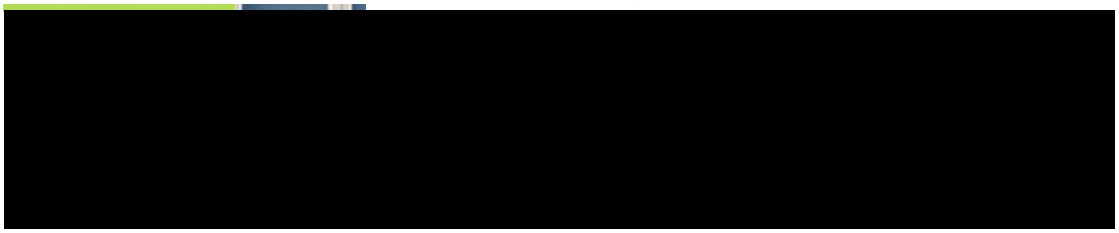
Social/interpersonal arguments



Health/illness of others

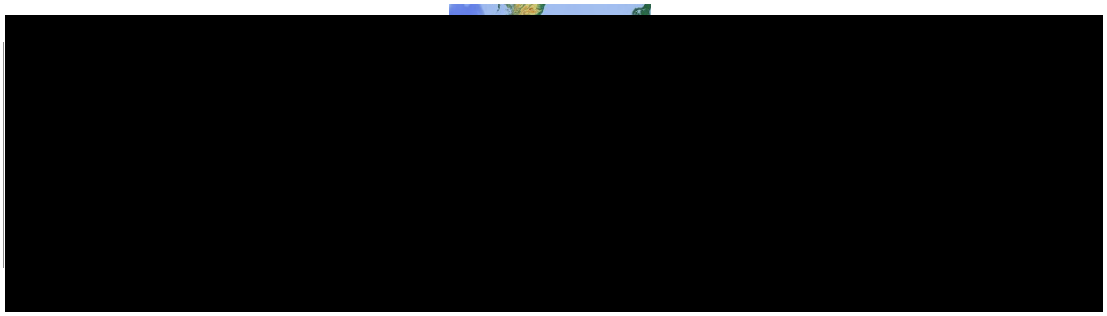
[redacted]

[redacted]

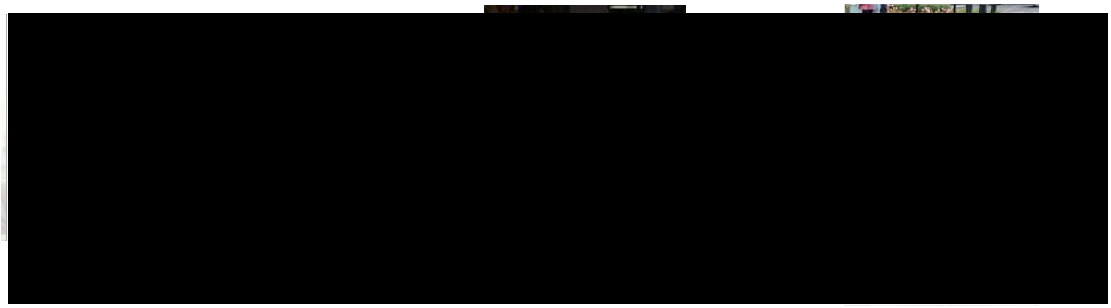


[redacted]

[redacted]eparation/distance



Health/illness of self



Having sufficient resources (ability to cope): deal with, manageable, adaptable, resolved, overcome, handle, controllable, doable, effective, functional, flexible, feasible

Not having sufficient resources (inability to cope): struggle, unmanageable, unresolved, uncontrollable, mismanage, unfeasible, inflexible, mishandle, ineffective, dysfunctional, maladaptive, unfavourable

[redacted]

The instructions of the IAT were presented on the screen as follows:

In this study, you will complete a computer-based task in which you will be asked to sort images and words into groups as fast as you can using the ‘e’ and ‘i’ computer keys to categorise items into groups. This study should take about 45 minutes to complete (including the questionnaire). There are seven parts. The instructions change for each part.

In the first part, you are asked to sort images into categories which are related to stressful problems that may happen in everyday life.

Put a left finger on the ‘e’ key for stressful everyday problems that you would be more able to deal with and control them; you could expect that they might occur; you may have already experienced them before; and they might have been regarded as more old-fashioned. Old stressful problems have been considered as an integral part of human beings' history and evolution. Categorise these images into the “Old problems” category.

Put a right finger on the ‘i’ key for stressful everyday problems that you would be less able to deal with and control them; you could not predict that they might occur; you might have not experienced them before; and they might have been regarded as more contemporary and complex. Categorise these images into the “New problems” category.

Items will appear one at a time. You will receive a feedback in the end of each trial. Go as fast as you can while being accurate. Press the space bar when you are ready to start.

In the fourth part, you are asked to sort images and words, relating to stressful everyday problems and coping, into categories. Put a left finger on the ‘e’ key for items that belong to the categories “Old problems” and “Having sufficient resources”. Put a right finger on the ‘i’ key for items that belong to the categories “New problems” and “Not having sufficient resources”. Each item belongs to only one category. You will receive feedback in the end of each trial. Go as fast as you can while being accurate. Press the space bar when you are ready to start.

Explicit measure

Listed below are a number of events that commonly occur in everyday life. Please read each statement. If the life event has never happened, please circle the number 0. If the life event has happened in your lifetime, please circle how stressful it was for you on a scale from 1-7. Some life events will not be at all stressful, others may be moderately stressful, while others may be very or extremely stressful. Do not take too long over your replies; your immediate reaction to each item will probably be more accurate than a long thought-out response.

Then please write down in the space provided after each statement either how you dealt with this life event or if it has not happened, how you imagine you would deal with it should it happen.

0	1	2	3	4	5	6	7
Not Happened	Not at all Stressful	Mildly Stressful		Moderately Stressful	Very Stressful		Extremely stressful

1. A close family friend or relative died (e.g. aunt, uncle, grandparent, cousin, etc.) 0 1 2 3 4 5 6 7

_____

_____

2. You have been unemployed and seeking work for a month or more 0 1 2 3 4 5 6 7

_____

_____

3. A close family member died (e.g. parent, sibling, partner, etc.) 0 1 2 3 4 5 6 7

_____

_____

4. You had a major financial crisis 0 1 2 3 4 5 6 7

_____

_____

5. You had a serious illness, injury or operation needing hospitalization, or a month or more off university or work 0 1 2 3 4 5 6 7

_____

6. You moved to the UK from Europe/overseas 0 1 2 3 4 5 6 7

7. You moved to another place (e.g., city or country) 0 1 2 3 4 5 6 7

8. You moved house 0 1 2 3 4 5 6 7

9. A close relative had a serious illness (from which they did not die) 0 1 2 3 4 5 6 7

10. There has been increasing serious arguments with your partner or steady friend 0 1 2 3 4 5 6 7

11. You had increasing arguments or difficulties with your partner or steady friend 0 1 2 3 4 5 6 7

12. There has been a serious increase in arguments or problems with someone who lives at home (excluding your partner or steady friend) 0 1 2 3 4 5 6 7

13. You have been separated from your partner for more than a month because of personal difficulties 0 1 2 3 4 5 6 7

14. You have been separated from your partner for more than a month (for reasons other than relationship difficulties) 0 1 2 3 4 5 6 7

15. You have been separated from someone important to you (other than close family members) 0 1 2 3 4 5 6 7

_____

_____

Appendix H: Procedure of calculation of improved IAT *D* scoring algorithm (Greenwald et al., 2003)

Columns in Excel	What they mean
Procedure[Block]	Order A or B (whether the consistent or inconsistent block was viewed first)
Trial	4 or 7 (the number is highlighted in green or red depending on if it was the consistent or inconsistent block)
State	Image or text
Stimulus	Label given to image or text by me
StimulusSlide.ACC	Score of 0 or 1 for accuracy (1 is a correct answer and 0 is incorrect)
StimulusSlide.RT	Reaction time
Accurate	If participant answered incorrectly then FALSE, if they answered correctly then True
CorrectBlock	Either F if incorrect response given, or if correct response given then actual RT is given
CorrectedTerms	If incorrect answer is given then correct average+600ms, if correct then actual RT given

Improved algorithm	What I did in Excel
Use data from B3, B4, B6 and B7	This is their four critical trials so I only need my two critical trials – 4 and 7
Eliminate trials with latencies >10,000 ms and subjects for whom more than 10% of trials have latency less than 300 ms	Done
Use all trials	Done

No extreme value treatment (beyond step 2)	Done
Compute mean of correct latencies for each block	Accurate =IF(E1=1,"T","FALSE") Corrected blocks =IF(G2="T",F2,"F") Trial4 correct average =AVERAGE(H2:H33) Trial7 correct average =AVERAGE(H34:H65)
Compute one pooled *SD* for all trials in B3 and B6, another for B4 and B7	I only have to do this once for 4 and 7: *SD* trial 4 =STDEV.P(F2:F33) *SD* trial 7 =STDEV.P(F34:F65) 4 and 7 *SD* pooled =SQRT((N14^2 + N15^2)/2)
Replace each error latency with block mean (computed in step 5) + 600 ms	Corrected Terms =IF(H2="F",N11+600,F2)
No transformation	Done
Average the resulting values for each of the four blocks	N/A as only had two blocks
Compute two differences: B6 – B3 and B7 – B4	Do this for two blocks: =SUM(N11 - N12)
Divide each difference by its associated pooled-trials *SD* from step 6	Do this once: =(N19/N17)
Average the two quotients from step 11	N/A as only had two blocks

Appendix I: Proposed indicative structure of the psychological scale to measure ancient and modern stressors

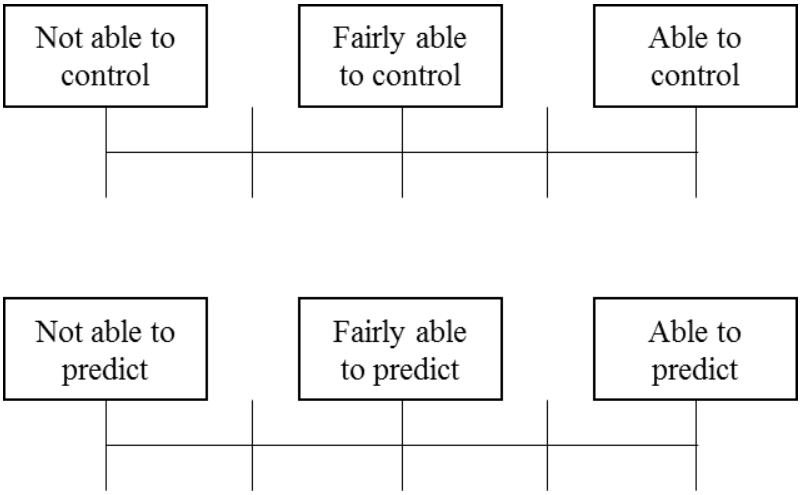
Below are situations that commonly occur in life and you are likely to have encountered. For each situation you have experienced, please indicate how stressful it was for you on a scale from 1-5 by circling a number. Some situations will not be stressful, others may be mildly or moderately stressful, while others may be very or extremely stressful. If a situation has never happened please indicate 0, and try to imagine yourself in that situation answering all the questions that follow in the order given. Remember that there are no right or wrong answers. Please respond as accurately and honestly as possible. Your responses are confidential.

1. While out for shopping, you receive a phone call and you are informed that a close family member or friend needs to go to A&E because s/he is feeling unwell.

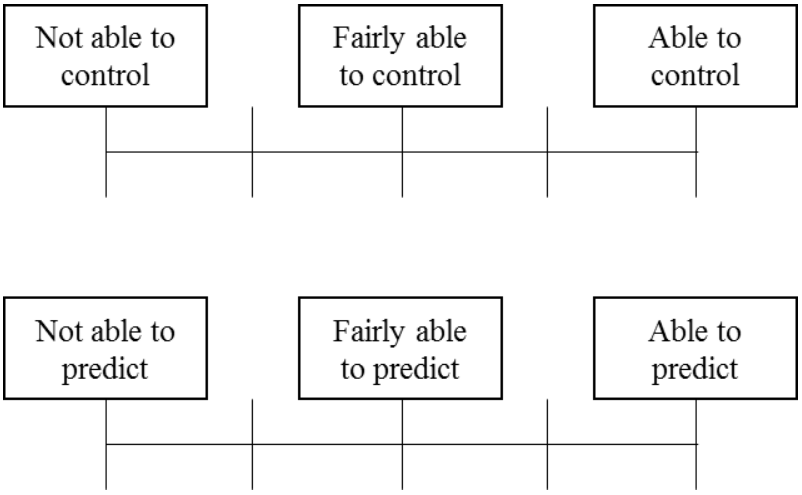
Not happened	Not at all stressful	Mildly stressful	Moderately stressful	Very stressful	Extremely stressful
0	1	2	3	4	5

a. Can you describe how you did deal (if you have experienced a similar situation in the past) or would deal with a similar situation (if this has never happened)?

b.i. If you have experienced a similar situation in the past, can you indicate in the thermometers below circling one of the vertical lines, how able you were to control and predict this situation? (If you have not experienced a similar situation, please move to b.ii.)



b.ii. If you have never experienced a similar situation, can you indicate in the thermometers below circling one of the vertical lines, how able you would be to control and predict this situation?



c. Lastly, we would like you to share your thoughts on a situation like this. Feel free to describe a similar life event and what you did, or how you would react if another life event occurred at the same time with this particular situation.